

# AVIATION

*The Oldest American Aeronautical Magazine*

MAY 14, 1928

Issued Weekly

PRICE 20 CENTS



Flight picture of a Waco 10 (Wright Whirlwind), with Charles W. Meyers at the stick.

VOLUME  
XXIV

## Special Features

NUMBER  
20

The Navy PN-12 Seaplane  
The New Curtiss "Chieftain"  
The Langley Field Maneuvers

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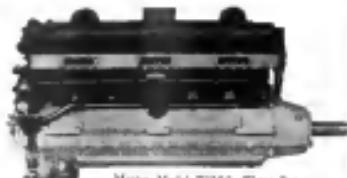
Thirteen Years of Pioneering in Aircraft Motor Development — 1915-1938



## PACKARD POWERED NAVY SHIPS SET PERFORMANCE RECORDS

FLYING a total of nearly 250,000 miles without accident, twenty-three Navy ships powered with 400 HP Packard Aviation Engines have successfully completed several months of torpedo practice at Guantanamo Bay, Cuba. The records they established of consistent, dependable performance mark a high development in the efficiency and reliability of the nation's air defense equipment.

Day after day, these ships were put through rigorous maneuvers. Carrying a full, regular



Marine Model T-3M-2. Three Pot  
Pump Ship. — Building Torpedo  
Ships. — Equipped with  
Packard 400 HP Aviation Engine  
Model T-3M-2. 31000. Driven

non load — a crew of four, gasoline enough to give effective range and a 1500 pound torpedo — they easily accomplished difficult tests.

At all times Packard Aviation Engines met every demand for power, speed, and endurance — qualities which have made Packard Motors the choice of experts throughout the world.

## PACKARD AVIATION ENGINES

ASK THE MAN WHO OWNS ONE

THANK YOU for visiting AVIATION



## WHY C A M I N E Z ?

An engine for aircraft must be more than an engine. It must possess maximum efficiency, reliability, minimum maintenance and maximum durability.

It must be supplemented by a thoroughly trained and highly responsible manufacturing organization . . . such as is back of the Fairchild-Caminez engine.

With a new factory built on its own flying field . . . with a quarter of a million dollars of individual air-dyne precision machinery installed and running . . . with a trained organization from metallurgists to service engineers . . . with factory service branches in Chicago, Dallas and Los Angeles — these are but a few of the evident preparations which the Fairchild-Caminez Engine Corporation has made to serve this year's demand for low-powered aircraft engines. The reliability of Fairchild-Caminez engines has been proven conclusively by innumerable official tests as well as by extensive flying. A Caminez engine can be serviced or overhauled in a fraction of the time required for other engines, because it has only half as many parts. As a result of the unusual efficiency of its slow-speed propeller, it will climb faster than any unpowered engine of equal horsepower.

Every part of every Caminez engine is made, inspected and tested in the Fairchild-Caminez plant, where uniform excellence of materials and workmanship is maintained to the highest degree. An assurance and assurance to you that you can depend on service for your 1938 Caminez engine in 1932 or in 1938.

Fairchild-Caminez engines are ready to serve your needs — to give you new performance thrill. They are now used in Kinner-Bausch, Travel Air and Waco planes. For performance particulars, specifications and complete data, address the Fairchild-Caminez Engine Corporation, Farmingdale, Long Island, N. Y.

SUBSIDIARY OF FAIRCHILD AVIATION CORPORATION



This is the first week of the FAIRCHILD-CAMINEZ plant, the present production of which is fifteen engines a week.

## CAMINEZ ENGINES



THANK YOU for visiting AVIATION

# The camera tells Mobil oil's story

Some of the famous Mobil flights are recorded on this page. Regular stock Mobil has lubricated a large percentage of the great flights in aviation history. You are always sure when you use—

The World's Quality Oil  
**Mobil**  
 VACUUM OIL COMPANY



(above) G. W. MEYERS writes to us recently, "As you know, I was lucky enough to be the first to fly across the Pacific (Okinawa, Tokyo, Sapporo) using Mobil 'R' with the usual perfect results."

 **Mobil**



(above) JAPAN GREETED a Czechoslovakian pilot, Col. Stanislav Straker, in his biplane, received after his record flight from Prague to Tokyo.

(below) A CLOSE-UP of "M" the "Spirit of St. Louis" has flown more than 31,000 miles with Mobil and without engine trouble.

Wide World Photo



(above) "ART" GUGGER — the first radio operator — built a man of the air that carried him safely to Moscow.



(left) THE MEN who flew around Japan last year used Mobil oil. Tokyo, Japan.

(right) MAJOR MILLER, who flew around the Union of South Africa, makes use of severe lubrication for his air plane.



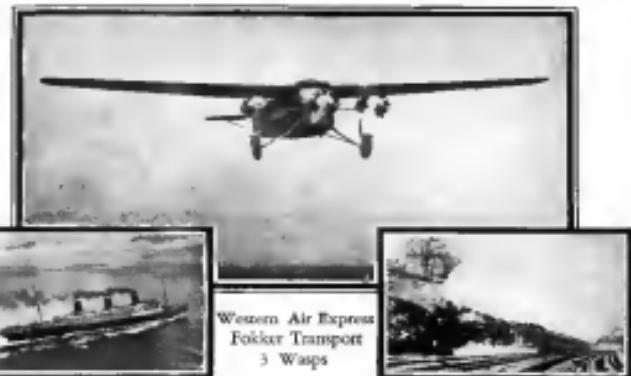
**VACUUM OIL COMPANY**

Other branches and distributing warehouses throughout the country

THANK YOU for visiting AVIATION

May 24, 1929

THANK YOU for visiting AVIATION



The Leviathan

Western Air Express  
 Fokker Transport  
 3 Wasps

The 20th Century Limited



## MULTI-MOTORED RESERVE POWER

The Leviathan, largest ship in the world, uses 65,000 Horse Power at normal cruising speed. There is available 90,000 Horse Power.

The Twentieth Century Limited, crack train of the New York Central, uses 1500 H. P. on its normal high speed run. There is available 4000 H. P.

The 1928 Wasp Engined Fokker Transports, purchased by Western Air Express for the Daniel Guggenheim Safety Passenger Line, use 600 H. P. in normal cruising. There is available 1200 H. P.

THE  
**PRATT & WHITNEY AIRCRAFT CO.**  
 HARTFORD CONNECTICUT

THANK YOU for visiting AVIATION

# The OX5 Situation and Miller Airplane Products

LAST November MILLER AIR-PLANE PRODUCTS factory opened its doors. This factory started production on a moderate scale of a number of OX5 improvements, which were the inventions of Mr. Miller and which had passed their merit on his own ships as well as hundreds of other OX5 motorized ships whose owners desired to obtain the wonderful results on their mottoes that Mr. Miller's inventions have made possible in the OX5. Most MILLER PRODUCTS have been in use for years although news before the opening of our factory were they advertised in the usual way. The only sales organization Mr. Miller had in past years was the satisfied users of his products who at every opportunity highly recommended them to their friends. In this manner over a thousand sales were accomplished. At the beginning a production schedule was decided upon which was considered adequate to care for the expected demand. Within two weeks we were forced to double production, adding more equipment and skilled personnel and yet the demand was greater than the supply. One principle of our plant ever since the start has been prompt deliveries, but due to the ever increasing sales, this has been impossible until this date. Now we have many times more equipment, skilled men and floor space, and today are on a production schedule equal to the extraordinary demand for our products and we believe that from this date we can realize no hesitation to make prompt deliveries on all orders.



Leslie C. Miller

Miller but still sells at the original price. In re-writing Rev's for OX5 he has retained the same value to the OX user and in addition has arranged the book in such a manner that it can now be used in connection with the training of new flyers. Rev's for OX5 was recently submitted to the chief instructor in the aviation department of one of the largest educational institutions in the world. This instructor's comments are as follows: "May I express my appreciation of a job well done?" Certainly for the purpose of conveying definite information to the reader, Mr. Miller has turned out a fine piece of work. I was able to obtain much information from this booklet that has cleared up doubtful points in my own mind." This is only one of the many unsolicited compliments received every day for Rev's for OX5. Write our information bureau for any information you may desire regarding the OX5 motor. Mr. Miller will gladly help out without charge anyone who respects this service.

## MILLER AIRPLANE PRODUCTS

P. O. BOX 643 or 3827 W. JEFFERSON ST., LOS ANGELES, CALIF., Phone Empire 3870

Write for Descriptive Folder of all Miller Airplane Products

THANK YOU for advertising AVIATION

To those who in the past our delivery service seemed tardy, we apologize, we did our best, and now promise prompt service to both old and new customers.

Just a word regarding our book, "Rev's for OX5." Over 2,000 copies of this book have been sold to OX owners who wanted to benefit by the store of knowledge of OX motors obtainable in this little book, which sells for \$1 and has many suggestions any one of which is worth twenty times the price. This book has just been re-written by Mr.

Miller but still sells at the original price. In re-writing Rev's for OX5 he has retained the same value to the OX user and in addition has arranged the book in such a manner that it can now be used in connection with the training of new flyers. Rev's for OX5 was recently submitted to the chief instructor in the aviation department of one of the largest educational institutions in the world. This instructor's comments are as follows: "May I express my appreciation of a job well done?" Certainly for the purpose of conveying definite information to the reader, Mr. Miller has turned out a fine piece of work. I was able to obtain much information from this booklet that has cleared up doubtful points in my own mind." This is only one of the many unsolicited compliments received every day for Rev's for OX5. Write our information bureau for any information you may desire regarding the OX5 motor. Mr. Miller will gladly help out without charge anyone who respects this service.

May 14, 1925

# Buy MILLER AIRPLANE PRODUCTS



### REV'S FOR OX5's

by Leslie C. MILLER  
of Los Angeles, Calif., author of the OX5 Carburetor and its controls for such small aircraft. Also to get more information, efficiency, reliability, economy, and the like, etc., etc. The author has over 2000 flying hours experience with the OX5.  
PRICE ONE DOLLAR.

### MILLER'S POSITIVE INTAKE VALVE CONTROL FOR OX5

Since 1915 on gas, add 20 to 30 more to the motor speed, takes all noise from the overhead. Greatly reduces friction in plane, lessening wear, valves, piston and prop. cost. OX5 one thousand sets now in use on OX5's in planes, speed boats, and racing cars. Standard equipment on Alexander Eaglerock, and now being adopted by other leading manufacturers.

PRICE, per set of eight, \$10.

### MILLER'S ROLLER ROCKER ARM

Preventing wear on exhaust valve guides and seats, doubles the life of the OX cylinder. The roller rolls freely across the valve stem end, instead of sticking and exerting a tremendous side pressure on the guide and valve seat as is the case with the former tapet. More power longer sustained.

PRICE, per set of eight, \$15.

### THE MILLER OVERHEAD SYSTEM

Includes the Miller overhead and intake valve control, all intake gas on every cylinder is held under constant pressure from one Centrifugal Ball Check Valve. Intake valve, intake gas at each cylinder. Prevents back pressure from prop exhaust and intake air. OX5 and prop rod.

Price for Eight cylinders, less push rods, \$85.00, With rods \$90.

### MILLER VALVE GUIDE REPLACEMENT SET

Includes a jig which holds in top of OX5 cylinder, through which a hand operated and easier to guide or should align to set out old guides. A key operating through them to dislodge the hole. We make the threaded gray iron guides.

Complete Set \$36.

Gray Iron Valve Guides \$65

### VALVE SEAT REAMER SET

Including part reaming, seat reaming and seat reaming. Every thing necessary to make new seat or to re-size large valves.

Complete Set \$22.50

We have standard and oversize intake valves, intake high compression piston pins, piston rings, cooler air pins, etc. Write for list.

Miller airplane products are sold on 30 days credit.  
Money refunded on all unsatisfactory purchases.



### MILLER AIRPLANE PRODUCTS

P. O. BOX 643 or 3827 W. JEFFERSON ST., LOS ANGELES, CALIF., Phone Empire 3870

10% discount for cash with order. 10% deposit required on all orders. Write your name, house or order direct.

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## The Consolidated Courier



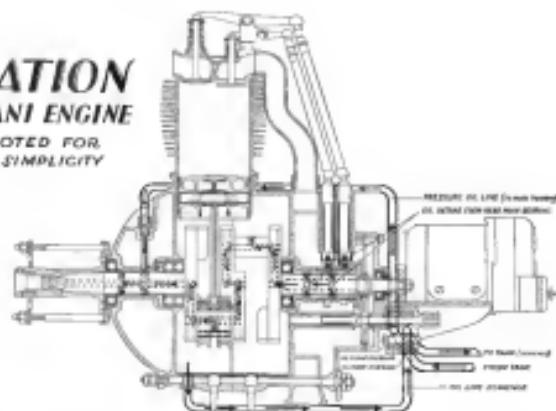
Consolidated Aircraft Corporation  
Buffalo, N.Y.



THANK YOU for visiting AVIATION

## LUBRICATION OF THE ANZANI ENGINE

A SYSTEM NOTED FOR  
ITS EFFECTIVE SIMPLICITY



**S**INCE the successful operation of any engine depends so much upon a proper supply of oil, the Anzani was designed with full appreciation of its great importance. Years of development have shown the adaptability resulting from the use of simple parts. The principal reason for the outstanding performance of the Anzani lubricating system is its unusual simplicity—its few parts are rugged and only accessible.

From the tank the oil is led to a pressure pump which forces it up to the main bearings and through drilled passages in the crankshaft to the connecting rod bearings. The rotary valve throws the oil to a line which lubricates cylinder walls, piston and bearings. Likewise, the timing gears and the rear of the engine are simply lubricated by direct pressure supply. The excess oil collects in the crankcase and drained through the sponge line at the bottom of case. The oil

before being put into circulation goes through a fine filter and, purified, is led back to the tank.

Proper clearances are given all working parts in order to obtain best results from the use of mineral oil. All Anzani engines are started with mineral oil (Mobiloid B). Any high grade oil corresponding to Lubritrol Aero Oil numbers 2 and 3 may be used satisfactorily.

The 1926 model Anzani Engines are especially adapted to American commercial use. They embody many new special features which assure the utmost in economy and dependability of operation for all requirements of from 10 to 100 h.p. We will be glad to furnish complete specifications. Let us know your requirements.

The following table lists models of the Anzani Engine, giving their principal dimensions and the requirements of light oil.				
Model	Normal Weight	No. of Cyl.	Power	Speed
1926	1,120	4	125	2,000
1926	1,120	4	150	2,000
1926	1,120	4	175	2,000
1926	1,120	4	200	2,000
1926	1,120	4	225	2,000
1926	1,120	4	250	2,000
1926	1,120	4	275	2,000
1926	1,120	4	300	2,000
1926	1,120	4	325	2,000
1926	1,120	4	350	2,000
1926	1,120	4	375	2,000
1926	1,120	4	400	2,000
1926	1,120	4	425	2,000
1926	1,120	4	450	2,000
1926	1,120	4	475	2,000
1926	1,120	4	500	2,000
1926	1,120	4	525	2,000
1926	1,120	4	550	2,000
1926	1,120	4	575	2,000
1926	1,120	4	600	2,000
1926	1,120	4	625	2,000
1926	1,120	4	650	2,000
1926	1,120	4	675	2,000
1926	1,120	4	700	2,000
1926	1,120	4	725	2,000
1926	1,120	4	750	2,000
1926	1,120	4	775	2,000
1926	1,120	4	800	2,000
1926	1,120	4	825	2,000
1926	1,120	4	850	2,000
1926	1,120	4	875	2,000
1926	1,120	4	900	2,000
1926	1,120	4	925	2,000
1926	1,120	4	950	2,000
1926	1,120	4	975	2,000
1926	1,120	4	1,000	2,000
1926	1,120	4	1,025	2,000
1926	1,120	4	1,050	2,000
1926	1,120	4	1,075	2,000
1926	1,120	4	1,100	2,000
1926	1,120	4	1,125	2,000
1926	1,120	4	1,150	2,000
1926	1,120	4	1,175	2,000
1926	1,120	4	1,200	2,000
1926	1,120	4	1,225	2,000
1926	1,120	4	1,250	2,000
1926	1,120	4	1,275	2,000
1926	1,120	4	1,300	2,000
1926	1,120	4	1,325	2,000
1926	1,120	4	1,350	2,000
1926	1,120	4	1,375	2,000
1926	1,120	4	1,400	2,000
1926	1,120	4	1,425	2,000
1926	1,120	4	1,450	2,000
1926	1,120	4	1,475	2,000
1926	1,120	4	1,500	2,000
1926	1,120	4	1,525	2,000
1926	1,120	4	1,550	2,000
1926	1,120	4	1,575	2,000
1926	1,120	4	1,600	2,000
1926	1,120	4	1,625	2,000
1926	1,120	4	1,650	2,000
1926	1,120	4	1,675	2,000
1926	1,120	4	1,700	2,000
1926	1,120	4	1,725	2,000
1926	1,120	4	1,750	2,000
1926	1,120	4	1,775	2,000
1926	1,120	4	1,800	2,000
1926	1,120	4	1,825	2,000
1926	1,120	4	1,850	2,000
1926	1,120	4	1,875	2,000
1926	1,120	4	1,900	2,000
1926	1,120	4	1,925	2,000
1926	1,120	4	1,950	2,000
1926	1,120	4	1,975	2,000
1926	1,120	4	2,000	2,000
1926	1,120	4	2,025	2,000
1926	1,120	4	2,050	2,000
1926	1,120	4	2,075	2,000
1926	1,120	4	2,100	2,000
1926	1,120	4	2,125	2,000
1926	1,120	4	2,150	2,000
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1926	1,120	4	2,550	2,000
1926	1,120	4	2,575	2,000
1926	1,120	4	2,600	2,000
1926	1,120	4	2,625	2,000
1926	1,120	4	2,650	2,000
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1926	1,120	4	2,900	2,000
1926	1,120	4	2,925	2,000
1926	1,120	4	2,950	2,000
1926	1,120	4	2,975	2,000
1926	1,120	4	3,000	2,000
1926	1,120	4	3,025	2,000
1926	1,120	4	3,050	2,000
1926	1,120	4	3,075	2,000
1926	1,120	4	3,100	2,000
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1926	1,120	4	5,475	2,000
1926	1,120	4	5,500	2,000
1926	1,120	4	5,525	2,000
1926	1,120	4	5,550	2,000
1926	1,120	4	5,575	2,000
1926	1,120	4	5,600	2,000
1926	1,120	4	5,625	2,000
1926	1,120			



## LEARN TO FLY at a PITCAIRN SCHOOL

The Pitcairn method of training pilots is unique. It is based upon Pitcairn experience as manufacturers of aircraft, as commercial operators and as commercial operators of air-planes, resulting in an intimate knowledge of just what a pilot should be taught to qualify for private flying and general commercial work.

The Pitcairn method of instruction has been so successful that there are now schools operating in five eastern states. Each school is located on a commercial airport, giving students the advantage of intimate contact with commercial flying operations.

Courses of ten hours, twenty hours and fifty hours are offered, each course being supplementary to the next shorter, allowing a change to longer courses without interruption of study. The courses closely parallel those of military service schools and are conducted all-year-round. Reasonable board and lodging may be obtained near each field.

Anyone interested in learning to fly should investigate the Pitcairn Schools before making a choice. A booklet giving detailed information on Pitcairn methods of instruction with a synopsis of courses offered, and setting forth the many advantages of the Pitcairn Flying Schools, will be mailed at your request. Write for it today.

### PITCAIRN AVIATION INC.

LAND TITLE BUILDING, PHILADELPHIA



THANK YOU for visiting AVIATION

May 14, 1928

# STEEL



## Arrived Safely

Pitcairn Flying Schools are located at

ON PENNSYLVANIA  
Pitcairn Aviation of Philadelphia, Inc., located at the Philadelphia Naval Air Station, just south of Philadelphia. The school is located on the grounds of the Pitcairn Manufacturing Company, which has been recently purchased by the Pitcairn Company. The school is located in Germantown, Pa., where the Pitcairn Manufacturing Company has its headquarters.

IN VIRGINIA  
Pitcairn Aviation of Virginia, Inc., located at the Pitcairn Field at Fort Belvoir, just south of Washington, D. C. The school has complete equipment for flying, instruction, and maintenance. Located near the Pitcairn Field, the school is located in the town of Germantown, Va.

IN NORTH CAROLINA  
Pitcairn Aviation of North Carolina, Inc., located at the Pitcairn Field at the Piedmont Airport, at Winston-Salem, N. C. The school is located in the town of Winston-Salem, N. C., and is located in a former cotton mill.

IN SOUTH CAROLINA  
Pitcairn Aviation of Georgia, Inc., located at the Pitcairn Field at the Atlanta Municipal Airport, Atlanta, Ga. The school is located in the town of Atlanta, Ga., and is located in a former cotton mill.

IN OREGON  
Pitcairn Aviation of Oregon, Inc., located at the Pitcairn Field at the Portland Municipal Airport, Portland, Ore. The school is located in the town of Portland, Ore., and is located in the town of Portland, Ore.

THE LIMITED completeness of thousand-mile journeys and rolls smoothly into the corners. . . . A huge ocean liner, after a week of driving through heavy storms, floats hopelessly into the harbor and is warped into its dock. . . . An air liner ends its lengthy flight through wind and rain, and carries quietly to rest in the airport.

In the development of swift, safe transportation on land and sea, steel has played a leading part. And the extent to which steel is applied in these elder-established forms of travel is being rapidly duplicated in the younger but fast-growing business of air transportation.

It is axiomatic that every ounce that can be saved in the weight of a plane is just so much gain. For this reason it is worth noting that

in many cases in which steel has replaced other materials, the change, made primarily for the sake of far greater strength, actually results in a saving in weight, and a corresponding increase in pay load.

The strength of alloy steel is very responsive to proper heat treatment, and in this way steel can be produced having exceptionally high strength and endurance in proportion to weight.

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GEORGE H. WILKINS



**"Congratulations on Performance Wright Whirlwind Functioned Perfectly Every Minute of Flight from Barrow to Spitzbergen in Temperature to Forty-eight Below Zero."**

WILKINS—PHOTO

The story of the flight is too well-known to need repeating. The function of the engine has again been demonstrated. The skill of the flyers...the creation of the plane are facts known to all.

Just two wireless messages tell all that is necessary of the magnificence of the flight, and the power of the Wright Whirlwind Engine proved to Wilkins hop across the top of the world.

WRIGHT AERONAUTICAL CORPORATION  
FAIRFIELD, CONNECTICUT

CARRIERS PAY FOR AIRLINE. See Column 2, Column 2.

# WRIGHT

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# AVIATION

The Oldest American Aeronautical Magazine

MAY XXIV

MAY 14, 1936

No. 29

## The Tenth Anniversary

This is Air Mail Week, which has been officially designated in Air Mail Week, marks the tenth anniversary of the inauguration of air mail service in this country. On May 12, 1926 the first regular service, operated with planes and pilots borrowed from the War Department, was started between New York and Washington, D. C. Today there are over 32 routes in operation covering a total distance of 10,740 miles, 60,000 miles of which are flown for night flying. These routes serve some 31 cities and, according to a recent announcement by the Department of Commerce, every state in the Union will be served by air mail before the end of this year. For the first nine years and two months of this decade air mail service, operating was carried on by the Government, but since the end of that period the service has been in the hands of private carriers. What they did during the way of expansion and development of air mail service is well known. Their accomplishments stand as tributes to American pluck, American spirit, and American business methods. Ten years ago the Government showed the way and today American aeronautical enterprise is carrying on in an open field and making the air mail pay without the assistance of direct subsidies.

## The Aeronautical Center

MANY TOWNS are making a bid to become the "Detroit" of the aircraft industry. So far Wichita, Kan., seems to have been able to attract more companies and to lead up a bigger production than any other town in the country. The citizens of Wichita are keenly aware of the possibilities of growth in the aircraft industry but other cities are awakening and the competition is becoming keen. If the efforts of the Board of Commerce are the only factor Detroit would already be ahead.

Even after a town has become a center it is necessary to analyze just why this has occurred. Proximity to the raw materials is certainly one factor. In the case of airplanes this factor is of lesser importance because the raw materials are comparatively light and expensive while the cost of shipping the finished product, which is a very bulky and delicate, is much greater than the cost of shipping the raw material. Airplanes should probably therefore be built forty miles to the point where the greatest number are likely to be used. The labor market is the second important factor. Often, as in the case of Detroit, there was a comparatively small supply to begin with and later has followed the growth of the industry. Initial labor conditions must be favorable but it is very debatable whether the proximity of a very

large and powerful steel-and-iron industry creates a really favorable market. When the powerful industry has a big boom it is almost sure to draw away a large proportion of the labor of the smaller industry. Adequate financing and skilled management are also of extreme importance. If the industry grows as we expect it to it will be hard for the small town to secure adequate financing. The management problem will to a considerable extent settle itself because the personnel will grow up with the enterprise.

Of course it may be possible that there will not be an aeronautical center. Few industries are concentrated to the extent that the automobile industry is concentrated in Detroit. Shipping cost will tend to spread the industry and also the problem of producing thousands of small planes is very different from that of producing a few giant air transport planes. Under present manufacturing methods it is comparatively easy to start an airplane factory in a town. Within a few years however, probably, there will warrant the installation of very expensive machinery and the town with the other necessary advantages which first gets this machinery in operation will likely become the aeronautical center.

## Correct Pronunciation

A SHORT time ago we had the pleasure of listening as a group of prominent city officials catalogued a series of famous airmen. The various orations were splendidly delivered with the exception of the pronunciations of a most important word. That word was "aviation". And strange as it may appear, those orators are not the only ones who abuse the word. In fact many persons directly engaged in aeronautical industry pronounce the *av* in *aviation* as they pronounce the *av* in the word *hove*.

That is absolutely incorrect and reference to any standard dictionary will show that the first *a* is pronounced exactly the same as the second *a*. Not only is this true for the word *aviation* but also for the word *airplane*.

Perhaps to some the correct pronunciation of aeronautical terms is a small item, but to the majority it is of importance, if for no other reason than the desire to speak good English. Just now the aeronautical industry is engaged in the work of educating the non-flying public in the ways of the art. If it is to be a good teacher of the major items, it might just as well be a good teacher of the minor items. In other words, pronouncing *aviation* as *ay-vee-a-tion*

# The New Curtiss "Chieftain"

12 Cylinder Hexagon Engine Rated at 600 Hp. Weighs Only 900 Lb.

By ARTHUR NUTT

Chief Engineer, Curtiss Aeroplane & Motor Co., Inc.

**F**LIGHT TESTS were recently completed at Mitchel Field, N. Y., on the new 600 hp. Curtiss "Chieftain", largest air cooled aircraft engine in this country. The tests were conducted with the engine installed in a two-seater Curtiss Falcon, standard observation and attack plane of the Army Air Corps. The plane was flown by Lt. Col. E. P. Gaunt, Army pilot stationed at the Curtiss factory, and by "Casey" Jones, veteran Curtiss pilot.

Equipped with the "Chieftain" engine, the "Falcon" showed a performance that was superior to that of any other two-seater in the service. Its top speed was 155 mph., and the service rating 32,500 ft., while the initial rate of climb was 1870 ft./min.

The most remarkable feature of this performance is the speed of 155 mph., which is exactly the same as could be obtained from a water cooled engine of the same power in the same plane. Curtiss engineers point out that this is the first time in history that air cooled engines have been able to compete directly with water cooled types in pure speed. Usually, the substitution of an air cooled engine for a water cooled engine of the same power, while producing improved sheet and cooling, has resulted in a sacrifice of several miles per hour in top speed.

The excellent speed characteristics of the Chieftain engine is due to its unusual design, which is different from that of any other air cooled engine. Instead of having one row of cylinders arranged radially, as in the common practice, the Chieftain has two rows one behind the other, with six cylinders, arranged hexagonally, in each row. This arrangement



Front quarter view of the new Curtiss "Chieftain" 600 hp. air cooled engine.

markedly reduces the overall diameter of the engine, in reducing the head resistance and increasing the high speed. The frontal area per horsepower of the Chieftain engine is approximately one-half of the conventional non-supercharged air cooled engine.

The Chieftain engine has been under development by the Curtiss company for the past two years, with the assistance and guidance of the Air Service. It performed excellently throughout the trials at Mitchel Field, and at times is to fly to Wright Field, Dayton, Ohio, for Air Corps tests.

In April 1930 a study was started on the design of a 600 hp. air cooled aircraft engine. The first steps in the study were to analyze the types of engines as far as that has been done to study the possibilities of the different forms of engines which would be suitable in the large size contemplated. The types that were finally selected for study were as follows:

- 6 Cylinder Single Row Radial
- 12 Cylinder Two Row Radial
- 12 Cylinder
- 12 Cylinder Vee
- 12 Cylinder Hexagon

In addition to this study 10 important characteristics were to be considered:

1. Low weight per horse power
2. Head resistance and propeller efficiency
3. Visibility from the pilot's cockpit
4. High maximum speed
5. Overhead valve gear for high speed
6. Exhaust arrangement
7. Control of cooling air
8. Application of reduction gears
9. Overall dimensions particularly diameter and length
10. Smoothness of operation

#### Non-Cylinder Single Row Radial

This type would require an engine of from 1800 to 2000 cu. in. to develop about 600 bhp. at a speed in the neighborhood

of 1500 rpm., which is probably a rather optimistic speed, except to gain an engine of the power and displacement, using in the tank that the size of the cylinder bank is resulting in a poor cylinder cooling as efficiency, and the reciprocating engine on top vibration level, though it may be of the split crankshaft in a solid block and type, would be a difficult problem.

The outside diameter of a six cylinder radial engine at its power would be 56 in. to 60 in. in diameter which presents a very large frontal area with consequent blocking of the propeller, resulting in poor propeller efficiency. The added diameter increases the resistance so much that it has been found by experience that the larger radial engines in present planes make considerably no more speed than the low-chasis power radial engines with the smaller diameters. Of course, the rate of climb is increased but that does not often dislodge the importance of carrying high powered engines using much fuel without gaining more top speed.

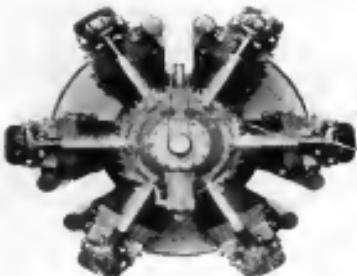
The related problem of a twelve cylinder radial becomes more difficult as the size of the engine increases. The manifold and intake assembly has to be so large in order to decrease the back pressure. The connecting assembly then becomes very heavy, unstable and cumbersome, resulting in the necessity of increasing the distance between the propeller and cylinders, where it is naturally has a detrimental effect on the cylinder cooling as well as reducing the cylinders very disadvantageous. A large diameter radial engine does not lend itself to good cooling and the adaptation of shutters for control of cylinder temperatures and temperatures under various weather conditions, is necessary to use push rod valve mechanism with the greatest efficiency of lubrication of the rocker arms, and to all inlet and outlet ports. The lubrication cannot be fully obtained without adding a great many pipe fittings and tubing which would not be reliable, would increase the expense and would be very unsatisfactory.

#### Fourteen Cylinder Two Row Radial

The type of engine has been used by several manufacturers in a power up to 600 hp., and is objectionable on account of its lack of satisfactory cooling of the nose row of cylinders, use the cylinder spacing is so close where the outside diameter of the engine is held to a minimum that the rear cylinder get hot air from the front cylinders. The push rod valve mechanism is also unsatisfactory on account of the necessity of staggering the cylinders to a great degree in order to keep the engine diameter down, resulting in high leadings to the push rods and possibility of increased wear on these parts.

The weight per horse power on the double row radial is slightly higher than the single row radial but it has the ad-

vantage of a small diameter which was the reason for investigating this type of engine. The displacement would have to be approximately 1800 cu. in., which would allow smaller cylinder than could be obtained in a nose cylinder type. Both these engines, the nine cylinder radial and 14 cylinder nose push rod valve gear, are probably limited in



Front view of the new Curtiss "Chieftain" 600 hp. air cooled engine.

engine speed although the engine speed has in the past few years been increased slightly over what was originally thought could be used with this type of valve gear. There is no question, however, that the push rod valve gear is inferior to the overhead type when high engine speeds are used.

#### Boxer Cylinder X

The X 16 cylinder engine has had great success in the field of construction on account of the large number of cylinders making the engine more expensive but the number of weight very heavy, unsatisfactory on the crankshaft in using the engine gear mechanism. The engine would also be heavier than the radial types on account of the longer crankshaft, although the diameter would be very satisfactory.

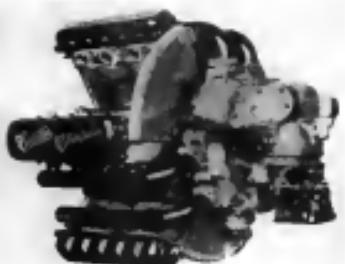
#### Twelve Cylinder Vee

This type of engine has been built successfully with air cooling. It has one very great objection, namely, an overall

Confidential on page 3398



Showing the new Curtiss "Chieftain" 600 hp. engine fitted in a Curtiss "Falcon" observation plane.



Rear quarter view of the "Chieftain" showing the cylinder heads and Stromberg carburetor.

# The Navy PN-12 Seaplane

First Patrol Plane Fitted With Air Cooled Engines has Top Speed of 107 M.P.H. and a Cruising Range of 1,350 Mi.

By COMDR. W. W. WEBSTER (CC), U.S.N.  
Chief Engineer, Naval Aircraft Factory

**T**HE PN-12, the Navy's first patrol plane with air cooled engines, has completed its preliminary trials at the Naval Aircraft Factory, Philadelphia, Pennsylvania. This airplane, for some unknown reason, has been referred to in the press as a seaplane plane. As a matter of fact, this airplane is merely another step in the Navy's development of the twin engine, heavy load type of plane for patrol work with the first, single, pusher, two engine, monoplane. This type started with F-5-2 and F-5-3 during the World War and has been developed step by step as indicated by the following table. The development of this type has been in charge of H. S. Goodlin, senior aeronautical engineer at the Naval Aircraft Factory.

Model	Year	Surface	Gross Weight	Engines	Span
PN-1	1926	Wood	2,400 lb.	2 Wright 250 Horse Power	52 ft.
PN-2	1926	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-3	1927	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-4	1928	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-5	1929	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-6	1930	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-7	1931	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-8	1932	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-9	1933	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-10	1934	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-11	1935	Wood	2,650 lb.	2 Wright 250 Horse Power	52 ft.
PN-12	1936	Wood	2,650 lb.	2 Wright "Cyclone" 350 Horse Power	52 ft.

Note: The PN-11 is of a different design and is not included in this series.

Practically the same hull form and displacement have been maintained throughout this development.

As will be seen from the above, the principal advances in the PN-12 over the PN-11, is the substitution of metal wings for wood wings and two Wright R-3700 air cooled engines for the former Packard water cooled engines. With the in-

ter change a saving of 1,600 lb. was effected in propulsive weight, with but a small loss in horsepower.

In the PN-12, therefore, is incorporated all of the improved structural and aerodynamic features applied to this type of plane, including metal construction throughout, air cooled engines, and composite mainwheels and undercarriage, including radio compass and arrangements for safety and recovering when on the water. The metal structure of this plane contains two complete and two partial nose, tail, bulkheads and side panels arrangements for maintenance of sea, land or flying fields. An additional feature of the PN-12 is an adjustable stabilizer.

Since the details of the PN-12 have not been completed it is not possible to give actual performance data of this plane. However, the calculated design data, based on the engine developing 325 hp. each at 1,900 rpm., and a maximum service weight of only 14,100 lb., is given in the following table. For the purpose of comparison, the corresponding data of the F-5-1 is given in the second column.

#### Service Condition as Patrol Plane

	PN-12	F-5-1
Gross Weight, lb.	14,100	14,100
Weight Empty, lb.	7,200	7,200
Useful Load, lb.	6,900	6,900
Gasoline, gal.	750	750
High Speed, mph.	107	107
Stalling Speed, mph.	35	35
Service Ceiling, ft.	30,000	30,000
Endurance, hr. (cruising)	18	18
Range, mi. (cruising)	1,350	1,350

Continued on page 1404



Front quarter view of the Navy PN-12 powered with two Wright "Cyclone" engines.

# Chassis Analysis

## Stress Analysis of Commercial Aircraft, Chapter Number Ten

By PROFESSOR ALEXANDER KLEMIN

Stanford University School of Aeronautics

And GEORGE F. TETTERTON

Chief of the Bureau of Aeronautics, Navy Department

**A**FTER THE wings have been analyzed the next problem is to analyze the chassis. The expansion of pilot plus cargo is as a plane smoothly on a general rule has a tendency to landing most as made on a rough road or in any surface and a bumpy landing results. The chassis must therefore be designed for the severe landing and, in as high conditions, a load factor must be introduced to give as required strength.

If the landing gear were rigid the shock of landing would cause the entire structure of the plane will beyond its allowable stress. It is therefore necessary to incorporate a shock-absorbing system somewhere in the chassis structure. This only absorbs dissipates the energy of landing, thus absorbing the impact or shock loads. The usual deflection of shock absorber is between 6 and 8 inches. The term comes out on testing that giving us additional deflection, which must be reduced to prevent when calculating the shock absorbing system. When the gear is rigid and the absorber are fully deflected it is apparent that the chassis then has a different trend and the angle of the struts have changed, etc. The analysis of the chassis is usually made for this fully deflected condition.

It is important that all parts of the chassis be of nearly equal strength. This is especially true of the wheels. It is best the greatest practice in the past to design a good, strong chassis, and then equip the plane with small wheels which have a rated strength well under the design value.

Requirements of the Consumer Department:

In chapter 3 the requirements of the Consumer Department are explained in detail. They will be reviewed here and the use of landing factors which has been revised since the publication of Chapter 3 will be reprinted. It is to be noted that the distinction between open cockpit and cabin planes has been done away with and the factor on the right side has been done away with and the factor on the right side has been increased. The table follows:

#### Landing Factors for Landing Conditions

Required Factor	Height of Free Fall	Drop for Shock Absorber (Inches)
1.00 lb. or less	8.5	28
1,000 lb.	8.5	28
2,000 lb.	8.0	18
Over 10,000 lb.	4.5	15

For instance the required load factor is 8.

The shock absorber must be designed to absorb the energy corresponding to the free drop listed above without subjecting the landing gear to the stresses corresponding to the load factor in landing. If the size of shock-absorber type of absorber is used the required factor may be increased 25 per cent but no reduction in the height of free drop is allowable.

**Landing Condition.**—The propeller axis is assumed horizontal and the known value of the vertical component of the resultant of the ground reaction is equal to the gross

weight at the surface since the chassis and wheels. The horizontal component is in all magnitudes required to give the reaction force in specified directions—i.e., the direction of a line drawn through the center of gravity of the plane and the axle.

**Level Landing with Side Load.**—In addition to the loads used in the level landing analysis, the loads due to a side component must be added in this condition. This side component is to be taken as one-quarter the vertical component of the level landing condition, and is assumed to act at the ground. The tire is assumed to be deflected one-half of the maximum diameter of the cross-section.

**Three-point Landing.**—The basic value of the case of the ground reaction is the gross weight of the airplane. The total load is divided between the chassis and tail skid in inverse proportion to the distances, measured parallel to the ground line, from the center of gravity of the airplane to points of contact with the ground. The load on the chassis is equal to the total load on the chassis minus chassis and wheel weight. The loads are assumed to be proportional to the gross load in the three-point landing condition.

**Design of Chassis Struts.**

When the strut is in pure tension or bending the ultimate tension or modulus of rupture value of the material used is the allowable stress. For struts in pure compression either the Euler or Johnson curves for columns must be used. In most types of chassis there is one strut or web which is in both tension and bending. The sum of these two pressures must be within the modulus of rupture of the material. These stresses usually may vary high and it is often necessary to use steel heat-treated to 150,000 or 160,000 lb. per sq. in. ultimate strength. Occasionally a strut will be in combined bending and compression. In this case the required stress is the sum of  $\sigma = My/I$  plus  $\sigma = P/A$ . The allowable stress may be obtained from the formula explained in previous chapters, namely:

$$\sigma = \frac{I}{4\pi^2} \cdot \frac{M}{R^2} \cdot \frac{E}{M} + \frac{P}{A} = \sigma_{allow}$$

The values of  $I$  and  $A$  needed for the design of struts may be obtained from Tables 4 and 5 of Chapter 5.

**Aeroplane Wheels.**

At the present time the great majority of airplane wheels are made of wire. Disk wheels have been developed but at present are not widely used. The strength, weight, and compact dimensions of commonly used standard wheels are listed in Table 16.

#### Table 16.—Properties of Standard Wheels.

Wheel	Rating	Weight	Width	Hub
	Load	Comb.	in.	lb.
	Pounds	lb.	in.	lb.
26 x 3	6,500	28	4.5	1,617
26 x 4	7,500	24	4.5	1,697
22 x 6	13,000	38	7.25	3,197

Continued on page 1404

# The Langley Field Maneuvers

Ninety Air Corps Planes take Part in Demonstration of Offensive And Defensive Value of Modern Military Aircraft

By EARL D. OSBORN

RECENTLY Hess has not only brought about great changes in aircraft design but has also been very successful developing an extremely large number of his multi-blade propellers. This was shown in a most interesting and effective feature for the combined aircraft maneuvers which were held at Langley Field, Va., on May 4, and which gathered together small groups from all over the country.

Langley Field, which is the home of the bombardment planes, is situated near Newport News and Fort Monroe. The locality has been a center of military activity and permanent garrison for more than 300 years. The bombing section consists of some 30 Keystone "Puritans" or L-5's. These planes which were built last year, are powered with two Liberty 400 hp engines, carry a load of 2,000 lb. of bombs, and have a ceiling of 30,000 ft.

From Selfridge Field, Mich., came the pursuit group, flying 25 Curtis "Hawks," which are powered with Curtiss D-22 engines. These planes are single seaters and carry two machine guns which shoot through the propeller. There is probably no group of pilots who equal the men from Selfridge in accuracy and formation.

From Tuscon came another group. This is a comparatively new, or rather, an undeviated branch of the air service, but in the maneuvers they gave a most convincing demonstration of their effectiveness. The planes, also built by Curtiss Aeroplans & Motor Co., Inc., carry six machine guns, two

and a number of other types of planes present, bringing in total up to over 180.

The noisy odd planes mentioned above are the targets of the day, the objective in which is to take place under the inspection of the air force. In 1927 there would be a total of 98 attack planes, 150 bombardment planes, 425 pursuit planes, and 380 observation planes, with 1,050 flying officers and 15,000 men



Aerial view of the Langley Field before the maneuvers.

Although there have been other concentrations of aircraft in previous years, this is the first one at which the attack group has participated on a large scale and in which all the various units of offensive aviation have functioned together.

Besides the pursuit, bombardment, and attack planes, there are observation, training planes, and a few miscellaneous types such as transports. The training planes of course are used in actual warfare and the observation planes are naturally as sensitive to the ground troops. The maneuvers at Langley Field were meant to show to the officers of the other branches of the service that were the functions of the various types of aircraft among the offensive, and what would be necessary measures to take against them. Insistently, also, of Congress and the press were advised to wait for the maneuvers. Several squadrons of bombing planes were sent up to Washington to receive the grants to Langley and the return flights, which were to follow, passed quite a bit of time during the staff required at this kind of flying.

Demonstrations were also held at Fort Benning, Ga., Fort Benning, Ga., Fort Sill, Okla., Fort Riley and Lawrence, Kan. These demonstrations came from the home base on classified training, as they are a secret appearance in actual war conditions.

The demonstration at Langley Field was begun by an attack upon a formation of bombers by pursuit planes. This attack took place over the field at an altitude of about 12,000 ft. The bombers flew in a very close wedge formation, with the leading planes somewhat higher than the next succeeding ones.

Continued on page 1387



A section of Langley Field, Va., as seen from the air.

on each wing, two in the gunner's cockpit, and two shooting through the propeller. They also carry a number of light bombs. These planes are used for attacking ground troops and fly very low, depending on their speed and light arm for protection.

The planes assembled at Langley consisted of 25 Pursuit, 22 Attack, 30 Bombers, 7 Observers, and 16 Transport; a total of 90 planes. This is not a very large number but if it were possible the total number of planes whose organization would be able to go into battle as a day's notice. There were

May 16, 1929

# Aeronautics in Sweden

First Air Line, Stockholm-Helsingfors was Established in 1924 and Since that Time Considerable Progress has Been Made

By A. L. OLSON

URING THE first three years of its existence, aerial navigation in Sweden has made gratifying progress. The service was inaugurated on June 2, 1924, with the opening of the air line between Stockholm and Helsingfors, Finland. A month later another line was in operation between Malmo, on the southern tip of Sweden, and Helsingfors. Since Malmo the line now extends north to include Gothenburg, Sweden's leading commercial port, and Oslo, the capital of Norway. Through three more air routes, Stockholm, Eskilstuna and Malmo, Sweden today is in direct connection by air with the leading cities of Europe as far north as Paris and Vienna.

The Stockholm-Helsingfors route was popular from the first. Last October, air service was suspended for the winter season, the Swedish and Finnish companies announced that a twice-a-day schedule was in prospect for 1926, especially during the height of the summer season. Such service will be part of a flight, say, from Stockholm to Helsingfors and a return the same day. This route is one of the most beautiful in Europe. It passes above the hundreds of islands that form the Stockholm archipelago, with only a 15 min. flight over water before the islands off the low Finska coast begin. The popularity of the route with tourists, as well as business men, accounts for the rapid increase in traffic from

air mail service and regular transport of goods.

The figures that follow indicate the development during the three-year period—the number of passengers carried and the total in kilograms of freight and mail.

1924 1925 1926

Passenger traffic	3,400	10,000	19,000
Freight and mail	400	6,000	12,000

From the first the Swedish company, A.-B. Transport, realized that it would have to depend on government sub-



Map of Sweden's air routes and their connection with those of Europe (1927).



Right, a view of a Swedish Junkers air liner flying over a body of water near Malmo.

In 1926 the total number of passengers carried was 19,000. In 1927 that total had been increased by more than 500.

Last year, near the end of the season, Malmo reported that they had been a 50 per cent. increase of passengers carried in 1927 as against the number of the year before, a 400 per cent. increase in transport of freight and approximately a 300 per cent. increase in carrying of mail. From the very beginning of the operation of the Swedish lines, passengers

travel in pairs, a situation similar to that existing in many other European countries. The Swedish Company was first incorporated for 250,000 kroner (1 Swedish krona = approximately 27 cents), later the sum was raised to one million. The government has lent its support with a subsidy pro rata per kilometer flown and loans for the purchase of "flying stock." Last August the company submitted to the Swedish Parliament an estimate of 3,000,000 kroner as the sum needed for the fiscal year 1928-9.

The planes selected for the service are the all-metal Junkers type, built in Sweden. For the regular passenger service the tri-motor plane, accommodating six or ten persons, is used. The single engine plane is used for local and special flights. The Swedish A.-B. Transport, a government body, decided on the all-metal Junkers as the plane that promised to ensure the greatest safety for the passengers.

Safety first is the motto on which the whole Swedish air service operates. This is to be expected in a country where the railroads are already made as reliable as road, compared with railroads elsewhere, for reliability of schedules. The air pilot is instructed to take no risks. As an example, he is told that it is often the better part of wisdom to return to the starting-point. Delays are less serious than double delays resulting in loss of life.

Continued on page 1388

## *The Lockheed "Air Express"*

Latest Design of Lockheed Aircraft Co., is powered with a "Wasp" and  
Has a Speed of 167 M.P.H. with Full Load of 1000 Lb.

PRELIMINARY FLIGHT tests were recently completed on the four-bladed "Air Express", the latest product of the Lockheed Aircraft Co., located at Burbank, Calif. The Air Express is an outgrowth of the original "Vega" design, which is the type of plane that Capt. George H. White used on his record flight across the North Pole, according

The Art Express is an all wood monoplane with monocoque fuselage and tail in the similar laminated plates. The chief characteristic of the new plane is so that it was designed to carry a Pratt & Whitney Whirlwind engine and has the tail can take personal wing or shear the tailplane on short center section planes.

Most remarkable of all features of this new plane is the phenomenal air lift which with full load at 10,000 ft. is 30 per cent. more than at sea level. At a speed of 170 mph in level flight was easily attained. The crossing speed of the Air Express is set at 125 mph. The Air Express will climb 3,400 ft. per min. at sea level and will climb to 10,000 ft. in 16 min. with full load.

The *Aer Express* does not differ in construction from the *Togo*, having the same monolithic plywood fuselage which is formed in a great concrete mold under a pressure of 30 tons in the sq. 11. This construction affords excellent strength and also lends itself to large scale production. For the benefit of those who may not remember the description of the *Von Braun* model, the Lockheed fuselage is constructed of two selected panels which are later joined together top and bottom; these come to tail. The shell is formed of plywood veneer strips laid in two diagonal grooves, layers and an longitudinal batten. Two coats of glaze are applied and the layers are worked into one and dried with great strength by being placed in a large oven mold and being subjected to a pressure of 30 tons for sq. 11 applied to an air bag in contact with the shell. The shell shall then be rolled out the base has no internal bracing other than the horizontal rings placed



The wings at all Lockheed planes are of well-crafted structure with a hollow box spar with plywood skin carrying a built-up Warren truss at this. The wing center is of plywood taking the drag load. Gasoline is carried in these wing tanks. This plane forward has been improved by the Air Express by the fact that the entire wing is cut out above the top of the fuselage on four clear sections with a single housing. The ailerons are fitted onto the same.

Although the logic and properties of the Leibniz rule



These quantitative measures facilitate the development of a specific protocol associated with a *Protein Ubiquitination* pathway.

Feb 24, 1984

against the lighting or moving credits, this product has been designed primarily as a commercial model and is not necessarily limited to 14,400 lb. and the freightage is not to be designed to a very high safety factor. The safety of the enclosed baggage is rated to be in the class of any steel numbers, which might collapse and crush the passenger and in the characteristics of the plywood shell which will not shatter or shuck at any point and exert a great resistance to the impact of the baggage structure. An added factor is to be incorporated into the design of the Air Express by using the jet to the rear and above the passenger's cabin. In this position he is cut in the open and has clear unobstructed vision in practically every direction.

terior of the cabin pleasantly quiet while in flight. The Lockheed type of construction is the result of many years of development work. No expense has been spared to learn the best method for the accomplishment of every detail of construction. The result has been the perfecting of every



Anterior view of the well-preserved skull of the *Leptostomias* (see Fig. 1).



This is a photograph of the Lockheed "air霸王".

on the left, lined side of the insulation. These cracks in the insulation are permanent. The passengers are all packed and ready for their competition all will be packed and ready for their competition, the Blue is suspended, and insulation is folded for easy entrance and exit. The Blue has a double light installed at the ceiling and is equipped for night flying. Ventilating windows installed in the passenger cabin, the entire plane is built for rapid air travel. The cabin is heated, which is needed, making the Blue a pleasure to fly in.

The maximum speed of the Lockheed Air Express, as indicated	190 m.p.h.
Wing span	81 ft.
Length	27' 5"
Cargo space	95 to 100 cu. ft.
Passenger capacity	2 to 4 persons
Pilot capacity	160 miles
Oil capacity	16 gal.
Pay load maximum	1,660 lbs.
Range	410 lbs. Pratt & Whitney Wasp

Chairman on page 1551

## Lieutenant Thomas Sets New Solo Flight Record Through Endurance Attempt Fails

THREE EIGHT HUNDRED hours' attempt to break the world endurance record of his Type C9B Bessonneau monoplane "Elinance" ended in failure, Lieut. Royal V. Thomas of Detroit, Mich., nevertheless set a new world's air race flight duration mark in flying his Wright Whirlwind-powered plane for 26 hr 20 min. 5 sec. The former record of 25 hr 26 min. 30 sec. set by Col. Charles A. Lindbergh in his flight of 33 hr 26 min. in Paris last May. Lieutenant Thomas had started to pass Lindbergh's mark and then broke the record of 25 hr 26 min. 30 sec. set by Eddie Bannister and George Holman on March 26 in a Bessonneau plane.

After a short start in which he found his gasoline load of 500 gal. was leaking from his gasoline tanks, Lieutenant



The Bessonneau-powered Bessonneau monoplane, "Elinance" on which Lieut. Royal V. Thomas set a new solo duration mark.

Thomas landed, learned his fuel load to about 400 gal., and again took off. He left Roosevelt Field, L. I., unsuccessfully at 12:30-00 P.M. May 3 and flew the distance until 21:57-09 P.M. May 5 at which time a leak in the decompression valve of the main fuel tank grew larger and caused the valve to give way resulting in a great gasoline loss. Lieutenant Thomas made his landing at Mitchel Field a half mile from his take-off point at Roosevelt Field.

## Monument Erected at Kitty Hawk, N. C., Commemorates Pioneering of the Wrights

SPONSORED BY Capt. Wilson Tate, who brought the Wright brothers to visit Kitty Hawk, N. C., for their experiments, a monument has been erected near the house where the North Carolina village honored the heavier-than-air flight pioneers, Orville and Wilbur Wright. The inscription on the stone reads: "On this spot Sept. 17, 1900, Wilbur Wright began the assembly of the Wright brothers' first experimental glider which led to man's conquest of the air." Erected by the citizens of Kitty Hawk, N. C., 1928."

The work of the first flight, made by Orville Wright in the comparatively frail biplane engine-powered biplane on Dec. 17, 1903, was 1000 feet high, three miles from Kitty Hawk, where the brothers had chosen an extensive and sheltered course for the protection of their plane.

## Reynolds Aviation of North Carolina Takes Agency for Monocoques and Stinson Planes

GEORGE W. GRIE, business manager of Reynolds Aviation of North Carolina, Winston-Salem, N. C., returned from the Detroit Show with announcements that he has closed distribution contracts for the Monocoque plane and the Stinson monoplane, both four and six passenger types. The company

already has the agency for the Waco plane, and Mr. Grie states that it is planned eventually to have representation of practically every type of plane.

## Three Western Air Express Fokker F-10's Now Touring U. S. on Way to Los Angeles

THREE TRI-ENGINED Fokker F-10's are now en route from New York to Los Angeles, making stops en route at various points arranged by the various chambers of commerce in the respective communities. The first plane is in New York, the second is en route, while the third is en route to Atlanta and the fourth is en route to Los Angeles. The stops were arranged by the California Development Agency, with the cooperation of the Mexican Air Express, owner of the planes which are later to be used in journeys between San Francisco and Los Angeles.

Representatives of California are flying to each of the principal monoplane stops. These men are W. D. Longine, treasurer of the American Teachers' Association, Harry W. Moore, vice president of the Bank of Italy and one of the organizers of the new Stanford University School of aviation, and C. E. Cook, attorney and airways pilot. Western Air Express official is also flying in each plane.

### The Route

The routes being followed across the continent are as follows:

Northern route: Boston, Albany, Buffalo, Cleveland, Toledo, Detroit, Chicago, Milwaukee, Omaha, Denver, Salt Lake City, and Los Angeles. Central route: Philadelphia, Pittsburgh, Columbus, Dayton, Indianapolis, St. Louis, Kansas City, Wichita, Amarillo, El Paso, Tucson, Phoenix, Los Angeles. Southern route: Baltimore, Washington, Miami, Jacksonville, Atlanta, Mobile, New Orleans, Houston, Dallas, Fort Worth, Midland, El Paso, Tucson, San Diego, Los Angeles.

The Fokker F-10 plane, described in detail in last week's issue of *Aeronautics*, is the latest powerful monoplane type built in America. The F-10 is powered with three Pratt & Whitney Wasp engines developing a total of 1200 h.p. and has a high speed of 145 m.p.h. and is said to exceed in many commercial planes manufactured in Europe. The F-10 was constructed by the Atlantic Aircraft Corp. at Hadrill Heights, N. J.

## Red Bird Aircraft Co. Officials Tour State of Kansas in First Plane Company Building

THE FIRST plane to be completed by the Red Bird Aircraft Co., Bixby, Okla., an OX-5 biplane, recently completed a demonstration tour throughout the State of Kansas. The making the trip were Harry Fugay, designer and general manager of the company, Merton Gossom, engineer, and Ed Ross, chief test pilot. Stops were made at Topeka, Wichita, Wichita Falls, Amarillo, Fort Riley, and other cities.

It was stated by an official of the company that the first flight of the plane on the tour started the company on its road to success in manufacturing biplanes and that the plane will soon be manufactured at the rate of one a week. The plane is said to have a remarkable quick take-off and landing speed due to the novel design by Fugay. The plane carried a load of 800 lb. on the entire trip. The plane is 30 ft. wide, with a span of 15 ft. 10 in. It has a span of 30 ft. on the upper wing and 30 ft. on the lower wing. It is 11 ft. 8 in. long and 5 ft. high. The wing area is 265 sq. ft.

## Neumann Report Lauds Work of Corsairs in Recent Attack on Rebels at Chipote

THE 1932 interesting feature of activities of the United States Marines is the successful results being obtained with the Neumann. Neumann is the standard aerials being obtained with the Neumann. Throughout the activities there, aerials have not been effective for all types of work, even including aerials against ground targets. In fact, in one of the most courageous attacks at Chipote, Vogt, "Corsair" planes conducted a successful, surprise attack on air and ground targets by a surprise, precise held by ground targets. The report from Neumann on this attack was as follows:

In the Chipote fight, Standard had 1500 men, well armed and well led, dug in on a mountain over 3000 ft. high. They had plenty of machine guns and plenty of ammunition. One and a half hours was the position and it would have taken a number of hours to carry the position and they would not have had time to do so. We had only "Corsairs" available when ordered to attack the position. We were off there with fragmentation and 50 lb. demolition bombs, fixed and flexible guns, and flushed up with incendiary and grenades. The first attack was planned as a preliminary strike, believing the strength of the enemy and small number of planes would require at least four attacks to knock the job. A swift approach was made from an unexpected direction, striking in two salvoes without reconnoitering.

### Attack Met By Barrage

The attack was met by a barrage of incendiary rockets. We were down with fragmentation and 50 lb. demolition bombs, fixed and flexible guns, and flushed up with incendiary and grenades. The first attack was made with incendiary bombs. After the second attack, the incendiary came and there was a wild smoke. After that the party was wild and frantic, and after a few moments, the plane was badly mired up. On the third attack the machine was devoid of handline. According to Standard's own statement, his entire army deserted except about 120 of his old relatives. It all sounds like a fantastic story, but is nevertheless true. This adds another to the many other exploits the "Corsairs" have to their credit.

There were no casualties in the Marines in this attack, and as little damage in the planes was quickly repaired. This sort of aerial operation emphatically proves the value of aerial warfare, particularly over difficult country.

## Westchester Airways, Inc., Establishes Passenger Service Branch at Toledo, O.

ANNOUNCEMENT: HAB has made of the establishment of a branch of Westchester Airways, Inc., in Toledo. The new company will operate from the Toledo Municipal Field and the new Trans-Continental Field in its operation. Lieut. Harry J. Hensley is managing director and pilot. Capt. C. Gandy is recently stationed at Mitchell Field, who is connected with the new company.

One is in service in Cleveland, two hour service to Chicago, and five hour service to New York will be offered. New Stinson four-engine planes will be used. The concern also operates a service on Long Island, N. Y.

## Niemeyer, Coli, and Lindbergh Honored

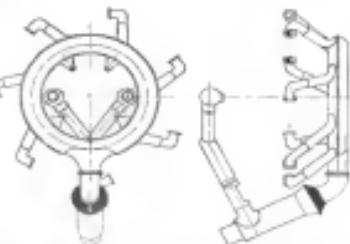
By a gift Erected at Le Bourget Field, Paris

A 300 SEEST was erected at Le Bourget Airport, Paris, on May 10, which honors the memory of Niemeyer and Coli, French aviators, who took off on that same day last year and were lost in an attempt to make a nonstop trans-Atlantic flight.

The 30 ft. shaft, a gift to France from Robert Neumann of Concord, N. H., also commemorates the flight of Col. Charles A. Lindbergh, the courageous aviator who died during "The Honor of Those Who Attempted and Have Won Success." The monument stands at the point of take off of the Niemeyer-Coli plane.

## Exhaust Rings are Provided as Standard Equipment on the Ryan-Siemens Engines

THE EXHAUST ring provided as standard equipment on the Ryan-Siemens engine, distributed by the Ryan Aeroplane Corp., San Diego, Calif., is in front of the cylinder, firing into the cowling on the plane and providing the proper streamlining in front of the cylinder to give even scaling. It consists of an angular ring with ports connected to the exhaust ports of the cylinder. The gases have at the hot



Exhaust manifold system of the seven cylinder, 120 hp. Ryan-Siemens engine. Note the lower cowling and the connection to the exhaust pipe fitted with a by-pass.

end of the cowling ring through pipes carried below the cowling. This is surrounded by a hot air shroud with a reversed opening, which is the exhaust ports, firing forward giving a slight amount of supercharging effect. There is an adjustment above the shroud to allow a regulation for the amount of air being drawn in by the牛shroud.

The system is said to reduce the noise and because of its arrangement reduces the fire hazard. It is made up of thin sheet iron with the smaller ring in two halves stamped out and with the sections welded together. The individual exhaust pipes are welded to the ring and a slip joint is provided to allow for expansion and contraction. The exhaust system, with preheater, weighs 13 lb., 25 lb., and 35 lb. for the 120, 150, and 200 cylinder engines, respectively.

## Hamilton Metalplane Co. Billboard Displays Attract Attention in Detroit During Show

LARGE BILLBOARD display advertisements of Hamilton Metalplane, manufactured by the Hamilton Metalplane Co. of Milwaukee attracted much attention in Detroit during the All-American Aircraft Show. The advertisements were in three colors and insistently urged the public to patronize the air mail.

As far as can be learned this is the first display poster which advertising of an airplane manufacturer in the United States.





**Champion Spark Plug Co. of Toledo, O.,  
Brings Out a New Aircraft Engine Plug**

THE CHAMPION Spark Plug Co., Toledo, recently announced the development of a new aircraft spark plug, the AE-5. The plug was designed by O. C. Rohde, chief engineer for the company. It was designed for operation under extreme conditions such as altitude changes from zero to full throttle, operation at high and low altitudes, as in certain maneuvers, varying weather conditions, etc. The plug employs additional features to overcome the objections to previous types. This new model is said to be exceptionally hard and strong and the plug is so designed that should it break it will still hold together and continue to function. In the AE-5 there have been incorporated some new principles of core design. In place of the standard straight tip with the electrodes cemented through the plug's entire length, the AE type uses two pieces of insulation. The first is a primary core with sufficient electrical clearance at the top to be safe. The second is a protecting and covering device of insulation which encloses the primary core and, in addition, aids in the insulation.



The new Champion Spark Plug.

brake.

Experimental plug of this design have been in use for some time. They were in the Wright Whirlwind engine of the Travel Air monoplane used by Smith and Brooks on their flight from San Francisco to Hawaii last summer and by Major Jameson who finished second on the First Flight to Hawaii. Last year Maj. Mario de Bernardi used these plugs in a Macchi Fiat plane when he set a world's speed record in Venice, Italy. In December Maj. Rocco Domeni established a world's altitude record using a Romeo-Jupiter engine with Champion spark plugs.

**Jacques Schneider, Seaplane Race Trophy  
Donor, Dies at Boulieu-sur-Mer, France**

REPORT that has passed from France that Jacques Schneider, French sportsman who donated the international seaplane speed trophy which bears his name, died on May 1 at Boulieu-sur-Mer. He was 50 years old.

Mr. Schneider presented the trophy to the Aero Club de Boulieu in 1912 for the purpose of developing aircraft through contests among the airmen in amateur ranks. Marcel Proust of France first won the Schneider Cup Race when he attained about 60 m.p.h. in 1913. England took the cup the following year.

During the war, the races were suspended to be begun again in 1920 when Italy took the trophy. The British took again in 1921 but England regained the cup in 1922 only to lose it in 1923 to the United States. This race was contested in the year that followed because the English and British air races were unable to get their planes ready in time.

In 1925 Louis, James Doolittle, United States pilot, kept the Schneider Cup in the country by turning in a speed of 222.67 m.p.h. De Bernardi of Italy surpassed this mark by flying 256.48 m.p.h. in 1926 to take the cup. The trophy is

now held by England, Louis, S. H. Webster having flown 251.48 m.p.h. at Venice last September.

Since the last races, Major de Bernardi of Italy has been credited with two seaplane speed marks bettering that of Webster. On Nov. 5, 1927, de Bernardi flew 259 m.p.h. and on March 30, 1928 he attained 219.57 m.p.h. over the Lido course at Venice in his Macchi M. 21 Fiat engined plane.

**Howard Woodall Flying an OX-5 Travel Air  
Is High Point Man in Dallas, Tex., Meet**

A TWO DAY meet recently held in Dallas, Tex., proved extremely disagreeable weather which prevented several visiting planes from arriving for the competition. About 1500 spectators were attracted to the field on the opening day.

Howard Woodall piloted his OX-5 Travel Air to high honors by winning the greatest number of points during the two days. In every event in which he entered, Woodall placed.

The \$10,000 in prize awards was distributed among winners in the various events, who placed as follows:

- 1st. Eddie E. Derryberry, Athens, OX-5 Travel Air
- 2nd. Howard Woodall, Dallas, OX-5 Travel Air
- 3rd. Ross Arnold, Fort Worth, OX-5 Travel Air
- 4th. Jim Landis, Dallas, OX-5 Travel Air
- 5th. Howard Woodall, Dallas, OX-5 Travel Air
- 6th. Ross Arnold, Fort Worth, OX-5 Travel Air
- 7th. Morris Cook, Dallas, OX-5 Travel Air
- 8th. Jim Landis, Dallas, OX-5 Travel Air
- 9th. Jack Lerner, Shreveport, Wright VE-6, Horse
- 10th. Jim Holden, Fort Worth, Whiteman Ryan Brougham
- 11th. Al Shirley, Fort Worth, Huff-Daland (Biplane Duster) Horse

Aerobatics (Six entries)

- 1st. (tie) Morris Cook, Dallas, OX-5 Travel Air
- 2nd. Herbert Kindred, Dallas, OX-5 Travel Air
- 3rd. Howard Woodall, Dallas, OX-5 Travel Air

The OX-5 Traveler prize was won by a pilot from Colorado flying an OX-5 International. He stepped away before his name was obtained. The meet was closed with a balloon tournament by R. M. Dewey.

**New Three Place Biplane Using the OX-5  
Is Built by M. C. Armed in Athens, Ga.**

A CONVENTIONAL three place biplane has been completed at Athens, Ga., and has been tested and found to be exceptionally stable. The plane was built by M. C. Armed and his son, Eddie, and M. C. Armed of the city.

The aircraft is a wood and wire biplane with an OX-5 engine. In construction, it has a welded steel tube fuselage and tail surfaces while the wings are of wood covered with fabric. A strength type of landing gear is used with the cylinder below the fuselage and braced to the landing gear struts. The plane is stated to weigh 1100 lb. empty and 1750 lb. loaded and to have a top speed of 95 m.p.h. with a landing speed of 35 m.p.h.

**Lunkenheimer Company of Cincinnati, O.,  
Publishes Booklet on Aircraft Fittings**

"LUNKENHEIMER AIR CRAFT FITTINGS" is the title of a small book now being distributed by the Lunkenheimer Company of Cincinnati, O. It gives complete engineering information and drawings showing the principal dimensions of the various types of Lunkenheimer aircraft fittings which include all kinds of pipe fittings, pressure fittings, fairing codes, and drain cocks.



SUPER TRIMOTOR T-10  
Three 400 H.P. "Wasp" Engines

## Fokkers for Success!

IT is not a coincidence that the most successful air race has been Fokker. Some owe their success to the fact that they equipped themselves with the dependable Fokker from the start. Others have achieved success through sound judgment and good management in their operations, and then

... as such leadership points the way to the purchase of the latest Fokker Aircraft.

Notable examples, in widely different fields, are the Western Coast Airways, Ltd., of Whittier, California, and the Pan-American Airways, Inc., of Key West and Miami. Both use Fokker aircraft.

And now, Western Air Express, the greatestponent of the newest possibilities of air transportation, adopts the new Fokker Super Trimotor T-10, the greatest Fokker ever built.

Specifications on Enclosed Report

ATLANTIC AIRCRAFT CORPORATION  
Factory and Flying Field  
Teterboro Airport, Haledon Heights, New Jersey

Subsidiary of FOKKER AIRCRAFT CORPORATION OF AMERICA, Wheeling, West Virginia



SAFEST IN THE WORLD

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THANK YOU for visiting AVIATION

## New Light Biplane With Cantilever Wings Built in England by George Parnall & Co.

A SOMEWHAT unconventional light plane was recently completed by George Parnall & Co., Bristol, England. The "Tug", as it has been named, is a biplane powered with a 60-hp Armstrong-Siddeley Genet engine. It is entirely of wood construction with cantilever wings. The plane weighs 880 lb empty and 1,230 lb. loaded. It has a high speed of 160 mph, with a landing speed of 40 mph.

The most radical feature is the construction of the plane in the wings. They are of cantilever design with the lower wing built in one panel and supporting the upper wing which is built in two panels hinged at the center section. The upper wing has a considerable sweep back, approximately 15 deg., in addition to a large cut out where the panels are joined. This makes for excellent vision through the cockpit windows and gives the plane a somewhat unconventional appearance. The wings themselves, which are of the R.A.F. 31 section—a fairly thick section with the center line curved to a medium camber—have dove tail ends. The covering is spruce veneer, varying in thickness according to the stress and covered with undoped fabric protected with paint. In-



The "Tug", new English light plane powered with 60 hp Armstrong-Siddeley diesel engine.

ternally there are a number of light struts replacing the usual two spar construction. Replacing the conventional type of rib are rounded plywood formers spaced according to the load requirements of the upper wing. The landing gear is of the oleo-damper type, including shock absorbers. For the type of structure a number of tests were made to determine the best spacing for the ribs and the proper thickness of the covering. The upper wing is set in have a lead fairer of 12 and the lower wing about 8. The wings do not fold but may be easily taken off by two people in a few minutes. There is no wire bracing and the only struts are the single tension members on each side.

### Used British Parachute Construction

The construction of the fuselage follows usual British practice for planes of this type. It has four outer longgues with the seats secured with plywood. Both sides and the bottom are flat while the top is convex with a light structure above the upper longgues. The upper longgues are quite high making for a deep fuselage. The two seats are placed so as to leave the floor of the fuselage slightly below the trailing edge of the upper wing. Both seats are held in place with side struts, the struts of the rear seat being longer than the others to accommodate the ailerons which are on the lower wing only. These struts extend the entire span of the lower wing and like the tail surface are of wood construction.

The five cylinder, static radial, Armstrong-Siddeley engine is mounted on the nose of the fuselage on a frame supported by square tubes braced with angles. In the fairing in front of the forward cockpit is the main fuel tank feeding to the engine by gravity.

The landing gear is of the through axle type with the shock

shockers consisting of a combination slot and helical spring type. The travel is about five inches and the travel is 2 ft. 8 in. The span of the biplane is 25 ft. 6 in. for the upper wing and 21 ft. 6 in. for the lower wing. The area of the upper wing is 178 sq. ft., including the ailerons which have an area of 33.7 sq. ft. The overall length of the plane is 27 ft. 2 in. and it stands about 7 ft. 8 in. with the tail skid on the ground.

### Newly Approved Kinner K-5 Radial Engine To Be Eligible in National Air Meet Race

FOLLOWING WORD that the Kinner K-5 160 hp aircraft engine had successfully passed the 30 hr. endurance test specified by the new regulations of the Department of Commerce, it has been announced by Dr. T. C. Young, director of the Kinner engine will be eligible for all races of the National Air Meet in Los Angeles during September for engines of 160 hp class.

In a telegram from the Bureau of Standards, Washington, D. C., Leslie Horwitz, Bureau test engineer, referred to the fact that the Kinner engine had successfully passed the test run of 30 hr. The first two hours were run at 120 rpm, 100% rated power, and then at 160 rpm, 100% rated power, for 28 hr. The engine was then run at 160 rpm and speed. The run was completed without a break and with only 14 rpm down on maximum speed at the end.

According to Francis Brumley, assistant manager of the Kinner factory, several orders have been wired to the engine plant since the successful completion of the test. In order for 160 engines come from the Taylor Brothers Inc. and Curtiss Corp., Rochester, N. Y., and a test order was placed by the American Eagle Airplane Co. of Kansas City.

### Beacon Airways, Inc., Los Angeles, Plans Establishment of a Large Flying School

PLANS FOR establishment of one of the largest flying schools in the country were recently announced by Leo J. Linn by W. H. Franklin, president of Beacon Airways, Inc., a concern with offices in Los Angeles, Fresno, San Francisco and Wichita, Kans. Immediate development of a large field on Main Drive is now under way and it is at the 10th that the new flying school is proposed.

Beacon Airways now distributes the Cessna,寇帝斯寇帝斯和 the bi-engined Franklin aircrafts of the state of California. The company is also experimenting with a series of passenger sport planes in an effort to offer the flying public planes in every price class. The planes to be called the "Aerob" are said to have particular adaptability on fast docks. It has a wing span of 20 ft. and a total weight of 880 lb.

### Alexander Miltborn Co. of Baltimore, Md., Develops New Cutting and Welding Torch

THE ALEXANDER Miltborn Co., Baltimore, Md., has developed a combination cutting and welding torch that is quickly be changed from cutting to welding without changing the tip. The essential feature changes the 72 torch in 1/2 turn of the tip. In this position the gases are introduced past the preheating passages while the high pressure oxygen is carried through the nozzle hole to either the other position, made by a quarter turn of the tip, so cutting oxygen is cut off and the welding gases pass directly through the normal passage of the cutting tip, making a welding base. Thus, this one torch can be used for both welding and cutting with practically no loss in time in tool changes. The tip is so designed that when it is cut off it is useless for cutting it can still be used for welding.

# New Champion Aviation spark plug

Revolutionary  
in Principle and  
Design

Thoroughly individual  
spark plug with  
the new Champion  
Aviation Spark Plug.



ENTIRELY new principle of design. Exclusive sili-mantite insulation—the finest insulating material known. Double insulation—primary protected by secondary "dome" insulator. Cooling air slots to reduce heat absorption. Choice of two types of electrodes. All-new, entirely gas-tight spark plug. Provides compression ratio, distance insulation as designed that the maximum insulation for breakers in such a way as to interfere with engine operation.

THE new Champion Aviation spark plug is not only a distinct innovation but is actually revolutionary in principle and design. It has already established new standards of spark plug performance in aircraft engines.

The unique design of the exclusive sili-mantite insulation, in which the primary is protected by the secondary "dome" insulator, provides protection and cooling areas impossible in ordinary spark plugs. The entire structure is so designed that it positively cannot be broken in such a way as to interfere with engine operation. Pre-

ignition and "cutting out" are practically impossible.

Developed after two years of painstaking research and rigorous tests, the new Champion Aviation spark plug further embodies all the excellence in material and manufacture exclusive to all Champion spark plugs.

Install a complete new set of Champion Aviation spark plugs which bring to your engine a new factor of safety and vastly improved performance and dependability.

Write for descriptive folder

# CHAMPION Spark Plugs

TOLEDO, OHIO

THANK YOU FOR reading AVIATION

**General Nobile at Kings Bay, Spitzbergen, Ready for Arctic Flights in the "Italia"**

HAVING LANDED his semi-cup dirigible "Italia" at Kings Bay, Spitzbergen, on Sunday May 6, Gen. Umberto Nobile is now preparing for several flights into the North Polar regions following a program which will commence the remainder of the spring and a large part of the summer.

The purpose of the flights is to gain a more scientific knowledge of the Arctic regions of the globe. A search is to be made for Crocker's Land, a tract which MacMillan was re-



The "Italia" in its hangar just outside of Elvstrøm, before the flight north

able to find in 1893 though many believed it discovered such a section as 1890; and another flight will be made in the opposite side of the Pole to learn, if possible, more about Nobile II Land north of the peninsula of Tassia, which was discovered by a Roman expedition under Captain Wilcock in 1893.

Nobile's ice breaking ship *Giulio Cesare* arrived at Kings Bay, Spitzbergen, on Wednesday May 2. This ship will be used as a base from which the various flights will be made. The *Italia* will carry a score of men on the explorations, many of whom will be veterans of the Amundsen-Elizabeth-Nobile flight over the North Pole in 1926 in the "Norge". The *Giulio Cesare* will carry a large crew of men for the handling of the dirigible.

**Stormy Weather Encountered**

Much stormy weather has been encountered by General Nobile in his flights from Milan, Italy, to Spitzbergen. Early April 20, the *Italia* left Biaggio Field, near Milan, and was headed toward Venice, Trieste, and Prague on the flight to Spitzbergen. However, the flight was apparently discontinued by a violent wind which lowered the speed of the dirigible to 10 m.p.h. In some sections, was met an onrushing wind of 40 m.p.h. and an average speed of the *Italia* of 60 m.p.h.

After losing his way over Bohemia, Czechoslovakia, and again finding his course from radio reports, General Nobile continued his journey and landed at Svalbard, Arcticana, near Spitz, on April 26. The 680 mi. flight had taken 30 hr. 40 min.

A two week's halt followed; then on May 3 the trip north was continued with a 1,500 mi. flight of 29 hr. duration to Valdes on the northern coast of Norway. In his flight, Nobile was again lost, this time over the Gulf of Bothnia. He

searched for several hours, it is reported, until the engine suffered loss of its position. The cockpit of the *Italia* is slightly damaged on landing at the snow-covered port of Valdes.

With the overhanging ice, the General continued on to Svalbard, where he landed next day. This flight of 550 mi. was made in 16½ hr.

**Robertson Aircraft Corp. and Thompson Aeronautical Corp. Get Mail Contract**

POSTMASTER GENERAL New has awarded to the Robertson Aircraft Corp. of St. Louis, Mo., the contract for carrying the air mail route from St. Louis, via Kansas City, Mo., to Omaha, Neb., and return. The bid of this firm was the lowest received, was for 25½ cents a pound. This is the lowest rate for carrying the mails over any route in existence, and, in the opinion of the Postmaster General, indicates that the business of carrying the mails in air is becoming a profitable one to private contractors.

The Thompson Aeronautical Corp. of Cleveland, O., was awarded the contract for carrying the mails by air on the route between Chicago, Ill., to Milwaukee, Wis., via Green Bay, Wis., to Bay City, via Toledo, Fla., and returning over the same route from Milwaukee to Peoria, Ill., via Cedar Rapids, Iowa, and Detroit, and to Indianapolis via Grand Rapids. The bid of this firm was 80 cents a pound and was the lowest received by any of the contestants in bidding bids.

The route from St. Louis to Omaha will not be placed in operation for several months as it will require the lighting of the airway for night flying. The route from Chicago is Indiana and Michigan ponds will commence operation during the early part of the summer or just as soon as the contractor can make arrangements for landing fields and place in equipment in condition for mail carrying.

**New Type of Wind Indicator is Installed At the Oakland, Calif., Municipal Airport**

AN UNUSUAL type of wind indicator has been installed at the Oakland Municipal Airport, Oakland, Calif. It is shaped like a small monoplane, has a wing span of 22 ft., a 34 ft. fuselage, and is outlined with neon lighting. The instrument is mounted on a 30 ft. tripod, over the demarcation line which is located in the southeast corner of the field. The neon lights make the indicator visible at night for many miles, and it can be seen through a fog from a ft. altitude.

Members of the Oakland pilot commission ordered construction of the indicator, and the contract for designing and constructing the novel equipment was given to the Aircraft Industries, San Leandro. Other airports are expected to adopt the new style soon.

**DH Moth With Slotted Wings is Displayed By Air Associates, Inc., at Curtiss Field**

AIR ASSOCIATES, Inc., of New York City has purchased a DH Moth plane equipped with slotted wings and is now exhibiting it at Curtiss Field, L. I., N. Y. Mr. Handley-Pope, now writing in America, has visited the field and explained the use of the slotted wing device to a few who have viewed the plane.

It is understood that Air Associates, Inc., plans to enter the Moth in the 1928 Ford Reliability Tour with James E. Taylor as pilot. The company's price for the plane is \$10,000.



THE Boeing Airplane Company is planning for that time, which is eventually coming, when airplanes will be an accepted mode

of speedy transportation, rather than the unusual. A staff of fifty to sixty aeronautical engineers, constantly employed in research, gives some indication of the extent to which the future is receiving attention.

This research is evolving economies in production.... greater safety.... lower operating costs.... higher speeds.

**Boeing Airplane Co.**  
Seattle, Washington

*Mail by Air and Speed is There*





**Lieuts. Gavin and Soucek Fly Navy PN-12  
Seaplane to New 36 Hr. Endurance Mark**

BETTERED BY 7 hr. 25 min., 44 sec., the world's flight duration record for seaplanes was broken on May 8 when a new record of 46 hr. 1 min. 44 sec. was established by Lieut. Arthur Gavin and Lieut. Max Soucek flying a Navy PN-12 seaplane powered with two Wright Cyclone engines, each developing 325 hp. The old record, which was 38 hr. 35 min. 27 sec., was set by Lieuts. G. H. Schindler and J. H. Kuhn in a PN-2 plane May 10, 1926.

Lieutenants Gavin and Soucek took off Thursday afternoon, May 3, at 2:28:28 from the Philadelphia Navy Yard. J. C. Froley, mechanic, and H. F. Bryant, Wright engine expert, accompanied the three, thus making the record breaking crew to four. At 1:25:54 P.M. Friday the old mark was broken, and at 2:54:30 A.M. Saturday the three landed at the Yard, fuel gone and new record set. The flight was under the supervision of the Navy Aircraft Factory.

Preparations for the flight were begun early Thursday morning, but bad weather delayed the take off until 9 A.M. A second take off was necessary, however, after 26 min. of the first flight. Gavin and Soucek were forced to land an account of oil trouble. Once in the air following repairs, the plane flew up and down the Delaware River at an average altitude of 300 ft. until late Friday night. At this time, they went to a higher altitude to land later in a glide when their gasoline was gone.

Official recognition was given the record by Capt. F. Schles at the National Aeronautic Association who arrived Friday evening to be on hand to verify the new mark. The entire team made for such record although experts feel that a flight is more than 40 hr. in length the old record will be surpassed by at least one hour. When the flight is from 24 to 48 hr., the record must exceed the old mark by but one-half hour.

Lieutenant Gavin and Soucek had their Trophy last year when he flew a total of 340 hr. without refueling. This record is given for endurance and safety in flying. Lieutenant Soucek is aviation superintendent of the mechanical section of the Philadelphia Navy Yard.

**Form Omaha-Winnipeg Airway Association  
To Promote Route Between Those Cities**

OMAHA-WINNIPEG Airway Association for promotion of air mail routes between the two midwestern cities was formed recently in Omaha. The association consists from commercial clubs in Grand Forks, N. D., Winona, S. D., Sioux Falls, S. D., Sioux City, Iowa, and Omaha. More than 20 delegates representing aviation committees and including city officials, attended a conference held at the Princess Hotel.

H. B. Lawrie, secretary of Sioux Falls Chamber of Commerce, was elected president of the association, and W. M. Skarby, secretary of Winona Chamber of Commerce, was chosen secretary.

At the close of a three hour session, at which it was decided to carry to Washington an application for a route between Omaha and Winnipeg, Gerald Stoen, Nebraska governor, and the National Aeronautic Association, who left later for Washington, was instructed to interview congressional and federal postal authorities to urge establishment of the proposed route.

The proposed route would include 600 mi. of territory between Omaha and Winnipeg, and would connect Grand Forks, N. D.; Fort Pierre, Watertown, S. D.; Sioux Falls, Sioux City, Ia.; and Omaha with the Canadian air.

Mr. Lawrie and Mr. Skarby, elected president and the vice president, during the two weeks before the conference made a review of the territory which would be served by the pro-

posed route, and at the meeting of aviation proponents a general movement interest and demand for the service which would result from establishment of the route. The audience, they reported, favored amateur air facilities in good emergency landings, and flying conditions were to be safety, they said, and are consequently good.

Lack of railway facilities from Winnipeg to Omaha are cited as one indication that the route, if established, will become a profitable undertaking. Fares from air transport companies, according to W. A. Elms, secretary of Omaha Chamber of Commerce, would possibly equal half the amount now paid to operators of road mail routes, on account of increased profit from passenger service.

**Arrow Aircraft Corp. of Havelock, Neb.  
Completes New Model Arrow Sport Plane**

THE ARROW Aircraft Corp., Havelock, Neb., recently announced the completion of its latest model, the Arrow Sport plane, a two place, open cockpit, all-wooden biplane.

The plane is a direct development from the old open design brought out by the company in 1926. This new open design will offer a 50 hp. LeBlond or Alatosa engine. The first to be completed was powered with a LeBlond air gaze and is claimed to have a top speed of 130 mph and a landing speed of 45 mph. It weighs 394 lb. empty and has a useful load of 450 lb. bringing the total weight up to 845 lb. This includes two people sitting side by side in the open



Front quarter view of the Arrow Sport plane

cockpit. The plane has exceptionally clean lines with no unnecessary bracing to support the tapered wings. However, the type enterprise clearly are optional with the purchaser. The plane is stated to sell for \$3500 at the factory.

**Recently Organized Sabine Airways, Inc.,  
Of Beaumont, Tex., in Waco Plane Dealer**

SABINE AIRWAYS, Inc., of Beaumont, Tex., a new organized air transportation company, has been formed at Waco, dealer for Southwest Texas by the University Air Service, state dealer. Delivery of the first plane had been made to Waco, and the second, which is expected to be a Ryan Monocoupe, will probably be received within a short time.

The Sabine Airways, Inc., will maintain headquarters at Beaumont, Tex., but will have operations units at Orange and Port Arthur in addition, according to Lieut. William K. Brumley, who has been named manager of the company. Brumley was formerly connected with the National Guard Auxiliary in Beaumont and is a graduate of Brooks and Kelly Field.

The company will occupy a hangar recently built at the Beaumont field by the Orange Car & Steel Company and will operate a school in connection with its air transportation work. A complete flying service will be maintained.

# Alexander — moves his Industries in twenty-four hours

On Friday, April 20, a fire destroyed the doping and wing covering building at the Alexander Industries, Denver. Eleven lives were lost and a number of men, through acts of heroism, received severe burns.

All doping and wing covering equipment, one hundred finished and partially finished wings, were consumed by the flames. The storage yard was filled with new Eaglerock aviation wings. One hundred and forty seven orders were yet to be filled. The Denver plant was badly crippled, and the huge new plant being constructed at Colorado Springs was only partially complete.

Certain public officials were bringing pressure to bear which was intensified on Monday night, April 23. Alexander officials were informed that the entire plant must be closed until an investigation could be made. Such pressure could have been revenue. Thousands of advertising film contracts had to be filled on schedule or a three million dollar annual business forfeited. Over three hundred employees found unemployment.

D. M. Alexander, vice president of the Industries, commented authoring his letter at midnight Monday, April 23, "We must sleep yet willing workers from elsewhere. Our telephone answering calls completed the job. By daylight beams and ladders were erected and the tremendous task of moving a great industrial plant was under way.

Moving companies removed all available vans and the grounds of the Alexander Industries with the

same care had taken on the semblance of a town movement in war time.

Very often you received through their rambling mass office furniture, files and sales' machinery, stage sets, cameras and the miscellaneous collection of equipment which represented the tools of one of the greatest industrial plants in the West. The used tool had begun.

Colorado Springs was seventy five miles away. Buildings for housing the Industries had already been arranged, the Bangs men and the Chamber of Commerce of this City had met the emergency.

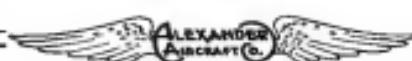
An abandoned church, actually laid out for offices, was thrown open at three to receive the massed. A stable became the film quarters. A warehouse was turned into a complete wood shop. A garage became a printing plant.

IN 24 HOURS "AS USUAL"  
Because the sun rises by the people of Colorado Springs. The gigantic undertakings which seemed all but impossible had been crowned with success.

The company is now located in one of the most friendly cities in the world. It has demonstrated itself so that the business is again in full swing. Eaglerock deliveries will again be regular by the time this issue is in the hands of "Aviation" readers.

A crew of 165 workers are speedily completing the main Eaglerock factory building which covers a ground area equal to a city block. Doping and wing covering now being done in especially arranged bays will soon be in new buildings. Eaglerock production is increasing from a two weeks delay and will soon be on schedule.

Our friends and customers — we have endeavored to give you this story as an offset to the erroneous reports which were placed on the wires throughout the country, that we were out of business, severely crippled, plant shut down, etc. etc. We are carrying on and are immediately increasing production of the quality ship you know — EAGLEROCK.



Division of the Alexander Industries, Inc., now located in Colorado Springs, Colorado  
CHARGE FEE for members AVIATION

**Schedule Tourist Air Cruise of Europe  
To Leave Bremerhaven This September**

CALLED "THE first air cruise in history," a tourist journey known as the "American Aviation Tour of Europe 1928" will cover 3,200 mi. in flight through Germany, Austria, Switzerland, France, Holland, and England early this fall. The project is under the auspices of the North German Lloyd, the German Luft Hansa, the Imperial Airways, Ltd., the Air Union, the Panair Company, and the Koen Luchtvaart Mij. of Amsterdam.

The Liquid-hydrogen Colossus will sail for trans-Atlantic passage early next month. The liner will leave New York September 5, cross the Atlantic, and dock at Bremerhaven, Germany. The air tour of Europe will follow. Special features of the trip will be announced at the International Aeronautical Ex-



Map showing the route of the American Aviation Tour of Europe

hibit to be held at that time in Berlin, conurbation of the world famous airplane works of Gotha in France, Fokker in Holland, Focke-Wulf, Junker, Rohr Kaiserstein, Hanover, Birkholz, Dallaire, Duray and Zeppelins in Germany, and other points of airplane interest in England and on the continent.

For the sake of variety, and to enable the tourists to see certain sections of the journey from the ground, the comparatively short distance from Bremer to Cologne will be made by rail. From Cologne to Cologne there will be the further contrast of a trip on the Rhine. From Cologne to the Croydon Field, via Paris, Berlin and Amsterdam, the cruise will be continued by airplane. At Southampton the tourists will board the "Colossus" to arrive back in New York October 29.

Cruise passengers will fly in a variety of planes, it is said, during the course of the journey—German, American, French, Dutch, and English—thus giving them a chance to learn more of the characteristics of the various foreign aircraft.

Full information concerning the trip may be secured from the Executive Committee, American Aviation Tour of Europe 1928, 22 Broadway, New York City.

**Gates-Day Company Now Building Factory  
For Manufacture of New Standard Planes**

DEFINITE ANNOUNCEMENT of the location of a new factory of The Gates-Day Aircraft Corp. in Paterson, N. J., has been made. It is at 900-910 East Steel St., Paterson, N. J., not far from the plant of The Wright Aeronautical Corp. This decision was made public following announcement that

a group of Paterson business men, headed by Hermon E. Rehder, president of the West Paterson Bank, had interested themselves in the organization.

New Standard planes will be produced with approximately 40 days. Charles H. Day, who designed and produced the famous J-1 Standard, said that machinery, material, and equipment will be installed in the factory. Production will be on a basis of 300 planes a year at the start, but will be stepped up to 500 a year within a short time, according to the designer.

The New Standard is a big plane, open cockpit, single place. It will sell for \$10,000, approximately, with 150 hp Hispano-Suiza engine, and corresponding higher price for new production water-cooled engine. Mr. Day said his designs have been made more than a year on the calculations and designs, which are now completed. Mr. Day, formerly chief engineer of The Standard Aeronautical Corp. during the war, has designed 22 successful types in his 22 yr. experience.

Officers of the corporation are Ivan E. Gates, president; Charles H. Day, vice president; George H. Dow, secretary; and Webster Hefflin, treasurer.

Assembly will be at Teterboro Airport, Hackettstown, N. J., the operating headquarters of The Gates Flying Corps, which is a subsidiary of the manufacturing corporation. The operations company includes the flying corps on tour in the West and East, the flying school, and the various aerial passenger, photographic, and advertising services of Teterboro Airport. The repair shop at Loft, N. J., will be maintained.

**Richard F. Hoyt Named Head of the Board  
Of Directors of the Pan-American Airways**

THE ELECTION of Richard F. Hoyt to chairmanship of the Board of Directors of the Pan-American Airways, has been announced. The company is operator of the first international air line for passengers and mail between Key West and Havana.

Mr. Hoyt is extremely active in aeronautical circles. In addition to his affiliations with the Pan-American Airways, Mr. Hoyt is chairman of the Board of the Wright Aeronautical Corp., a member of the board of the Kepstane Aircraft Corp., and an officer of the banking firm of Hispano-Suiza Co. Mr. Hoyt has just returned from an extended tour of Central and South America during which he made a careful survey of air travel conditions in those countries.

On the board of directors with Mr. Hoyt is George Miller of Hispano-Suiza Co., C. V. Whitney, director of the Guaranty Trust Co., Shean Gott, vice president of the Farmers Loan & Trust Co., John A. Hamblin of Hamblin & Company, R. B. McNamee, president of Hevler & Co., and J. T. Troppe, president of Pan-American Airways.

Mr. Troppe reports that since October 1927 the Pan-American Airways, Inc., has carried 370,000 lb. of mail and 700 passengers on a daily schedule which has been 100 per cent reliable. 275 full business days are added to the calendar who now use air service.

**Waco Plane Dealership in Ocala-Gainesville  
District of Florida Taken by Joe Bordens**

JOE BORDEN, automobile dealer of Ocala, Fla., has been announced as Waco agent for the Ocala-Gainesville district of the state. He has received his demonstration plane from a cargo of five received in Orlando, Fla., by Niles-Martin Co., state distributor, and flew it back to Ocala with his pilot, S. E. McLaughlin.

Three of the five planes of the latter company have been delivered and sales of the other two have been negotiated.

## FIRST ANNUAL WESTCHESTER SEAPLANE RACE MEET JULY 11th & 12th, 1928

Sanctioned by the  
National Aeronautical  
Association

Under the auspices of Playland,  
Westchester County  
Park System

Sandy, well protected beach.

Ample police grounds. Every facility for the care of seaplanes and flying boats is offered free of charge to all contestants.

### PRIZES

Handsome organization trophies and pilots' prizes for military events. Cash and pilots' prizes for civilian contests.

### RESERVE THESE DATES

Free Entertainment

Q. B. Headquarters

Entries are now being received by the  
Seaplane Race Committee

WESTCHESTER COUNTY PARK SYSTEM  
Playland  
Rye, N. Y.

## Form Metal Aircraft Co. of Cincinnati To Manufacture "Flamingo" Monoplanes

THE METAL AIRCRAFT CO. of Cincinnati was recently incorporated at Cincinnati, O., and the purpose of the company has been set forth as "manufacturing, dealing in, and other wise handling all kinds of aircraft and parts and accessories thereof." Immediate plans of the company, however, are to manufacture all-metal planes of the "Flamingo" class developed by Thomas E. Halpin and Ralph Grasham, Cincinnati, formerly of Detroit, the first of which was introduced in Cincinnati Easter Sunday to be taken immediately to the All-American Aircraft Show at Detroit after being skinned "Miss Cincinnati."

Incorporation of the company are T. H. E. Enderly, Thomas E. Halpin, Ralph P. Grasham, John C. Herrensen, H. G. Tamm, Jr., T. S. Goodman, Edithly F. Lusk, Tyler Field and John B. Hollister. Those in the financing group are Henry Tamm, Jr., Michael Tamm, Edithly Lusk, Thomas E. Goodman, John J. Stew, John M. Petters, Frederick H. Chaffield, William H. Hayes, Chaffield, Hayes, Chaffield, Jr., Tamm, Jr., James H. Hulbert, James C. Herrensen, J. Everett S. Gray, T. S. Goodman, W. L. Long, E. H. Long, Lorraine E. Grasham, Jr., G. H. Wright and O. D. Vandervelde, Jr.

This group, which had been discussing possible financing of the project from the start of the assembling of the first plane, on the day following its flight in Detroit put together and pledged money enough to finance the manufacture and distribution of the first 100. It was said that often also were received by Halpin and Grasham from financiers of New York, Chicago, Detroit, and St. Louis, to finance factories for production of the line in their respective cities, but the same money prompted them to accept the Cincinnati offer.

Options on sites adjoining Lester Field, the principal airport of Cincinnati, have been secured. Attorneys John C. Herrensen, John B. Hollister, Edithly F. Lusk and T. S. Goodman will represent the company in all matters pertaining to its location.

The type of plane to be produced is an all-metal, single engine transport monoplane, within the same weight range and price range of similar wooden planes. It will hold six passengers in addition to the pilot, fuel and express packages. It will also have a baggage compartment made for holding the doors, and it will have all other approved safety devices. The plane will weigh 3,000 lbs. and will carry 500 lbs. including crew and weight. Capacity speed will be 150 mph., starting speed 50 mph.

The plane will hold 150 gal. of gasoline and is expected to fly 2,000 mi. on one tank load with full load. There will be brakes on each of the two wheels of the landing gear. The Flamingo will be the largest seat, single engine air transport made to date, with a 48 ft. wing span and length of 32 ft. It will be able to also offer a range of 350 ft., indicated, or 380 ft. loaded.

The Flamingo was described in detail in the April 30 number of AVIATION.

## Geared Bristol Jupiter VIII Engine Passes The Official British 100 Hr. Approval Test

THE GEARED Bristol Jupiter engine has passed its 100 hr. official bench test of the British Air Ministry. The test was made on the seven VIII engine which was officially rated at 480 h.p. at 3,000 rpm. The engine maintained its power throughout the test, the full throttle brake horsepower developed at the end of the 100 hr. was within one per cent. of that developed at the start of the run. In order to cover the

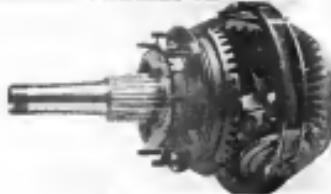
series IX and XI engines, which differ only in compressing ratios, a supplementary run of one hour at 3,000 rpm. at 2,000 rpm. was carried out on the 3.3 compression engine.

The manufacturer has submitted the following statement of the test:

*Preliminary Power Curve 150 h.p. — carried out at full throttle from 1,000 to 3,000 engine r.p.m.*

*Endurance Test 100 hr. — carried out at 2,000 engine rpm. and at the 10 per cent. equivalent ground rating, in 2 h. and 40 hr. non-stop runs. The final hour engine was at full rated power.*

*High Speed Test 2 hr. — carried out at 2,000 engine r.p.m.*



*Front view of the engine showing the reduction gear case and propeller.*

*At 5 per cent. in excess of the maximum permissible rpm. after starting and acceleration 30 sec. — sustained running 400 engine r.p.m. and accelerations up to normal rpm.*

*High Power Test 2 hr. — carried out at maximum permissible r.p.m. and at 4 per cent. in excess of rated power.*

*Final Power Curve 150 h.p. — carried out at full throttle from 1,000 to 2,000 engine r.p.m.*

*Fast and full Consumption — the average consumption in the 100 hr. endurance test at 10 per cent. power was.*

*Fuel 2150 gal. per hr.*

*Oil 10 pt. per hr.*

## W. W. Dunlap Paper Tells of Successful Spot Welding Using the Aluminum Alloy

AT A recent meeting of the Detroit, Mich., section of the American Welding Society W. W. Dunlap presented a paper dealing with the results of an investigation of the techniques of spot welding of aluminum alloys by the Aluminum Co. of America at New Kensington, Pa. According to the results obtained, aluminum alloys can be spot welded successfully giving approximately the same strength as a similar metal. The secret of the process lies in the fact that the electrodes were of copper, aluminum plated. It was necessary to plate the copper with aluminum as aluminum does not readily alloy with aluminum while uncoated copper electrodes formed a layer of copper-aluminum alloy which produced a hard weld because of the danger of having a hole in the sheet by striking. The tests were made with all types of aluminum alloys and it was found that when two flat sheets of 1/8 in. were spot welded together at two points, the load had an efficiency of 63 per cent. When these points were used the efficiency of the joint was 64 per cent. while when the strips were welded at four points the weld was stronger than the virgin.

## First Steps Taken in Cincinnati Toward City Department of Aeronautics

THE AERONAUTICAL development in Cincinnati has reached the point where a decision must be made concerning the proper departments and officials to control aviation, that place must be set aside for the building of the city's first air port or station, and that an aeronautical bureau to supply reliable information to pilots and passengers must be established in the possession of C. O. Sherrill, city manager, who has taken the initial steps in these matters.

Following a conference between Sherrill and the City Council, it was decided to vest control of the municipal airport, Lester Field, in the Department of Public Utilities, giving the department a measure of control over private companies using the municipal port, and full control over such non-aeroplane ports as may be established.

### FAVOR PARTIAL CITY CONTROL

The director of public utilities already has been given jurisdiction over gas, electricity, traction, and other utilities and private companies using airports will have to have schedules of routes, arrival and departure, rates of fare, and other matters in which the public is interested, it is felt that the city should have a voice in these controls. A review of rules and ordinances by Sherrill's legal experts has revealed no obstacles in the way of vesting such authority in the Department of Public Utilities.

Sherrill further has expressed himself as favoring appointment of a director for the municipal airport, who shall be a pilot and a man with practical experience as well as scientific knowledge of air navigation and airports. Such a man, he feels, could most intelligently serve pilots and public, and it is felt that the entire country will be interested for the last available.

Apparatus and equipment of the passenger station, when completed, will be comparable to those of a modern railroad station, clean and comfortable, comfortable with the facilities needs of the times. At such a rate for chartering this work has not yet been set.

The aeronautical information bureau is to be established either in the City Hall or a more convenient downtown location—possibly in a room in Government Square—and will furnish complete daily information to all interested persons concerning weather, routes, and fields of the United States.

## Gordon Bennett Balloon Race Preliminaries Will be Held at Pittsburgh Memorial Day

ARRANGEMENTS have now been completed by Walter Chambers, aviation editor of the Star-Tribune and president, to hold the 1932 National Balloon Race in the balloon field at Bettis Field, Pittsburgh, on Decoration Day. The local club of Pittsburgh is to assist in the entertainment of the visiting pilots and other aeronautical guests that are expected to be present.

The National Aeromarine Association has announced that the winners of the first three places in the Pittsburgh class will be entered in the Gordon Bennett International Balloon Race which will start from Detroit June 30. Twelve balloons have already been entered in the race.

The committee is composed of the following men: Samuel O. Wharton, general manager of the Duquesne Shops, Carnegie Steel Co., chairman; W. A. Irvin, vice president, American Steel and Tin Plate Co., vice chairman; Harry C. Neal, president of the Bettis Field Corp., and director in the First National Bank of McKeesport, treasurer; and Walter Chambers, manager.

# FLOCO

THE new air in  
aviation motor combustion  
methods is here. § New standards  
for motor performance and design here  
within the industry to successfully cope  
with the modern problems of aviation. § To meet  
these newer demands the Floco 8-Cylinder Radial Air-  
Cooled Motor has been produced. It is the result of years  
of untiring effort, of the most modern and advanced engi-  
neering and it combines with these, a construction featuring  
the use of materials that the finest quality materials  
obtainable. Yet, within, Floco is modestly priced. § Floco  
brings a new conception of power and speed combined  
to the end that the greatest dependability is obtained.  
It assumes, at once, its rightful place as the out-  
standing aviation motor of the new age. It seems,  
in even respect, the demands of the commercial  
plane manufacturer for a motor of modern  
refinement at a low cost.



*Floco A-8R. 8-Cylinder Radial Air-Cooled  
Motor. 150 H.P. Normal at 1800 R.P.M.*

*Complete Information on Request*

**FRANK L. ODEMBREK, Inc.**  
135 West Seventeenth Street, Los Angeles, California



tables and figures of popular passenger flying when the season for 1938 draws to a close.

The biplane used for this tour was a Junkers, type F13, provided with a Junkers L13 engine. It is an interesting commentary on the topography of Sweden that the pilot was able to effect a landing within range of nearly every town of the country. One-eighth of the total area of Sweden is water, and the large towns are concentrated around the water-front of lake or river or inlet of sea. In fact, only ten towns in all were passed by because of inadequate landing facilities



Transferring an injured man from a Swedish air ambulance to a ground ambulance

for a biplane. In addition, four other towns were omitted from the schedule—Karlskrona, Växjö, Elagård, and Boden—since they lie in areas prohibited to civilian flying.

At Boden, one of these four towns, is concentrated another type of air service. This is the station for the air ambulance work of the Swedish Red Cross. Some years ago Prince

Carl, brother of King Gustaf V and one of the many members of the Swedish Royal family that are actively engaged in the work of the world, laid the foundation for this service of protecting the ambulance plane for aerial work as it was then then in the wilderness of the north. The ambulance | con-



One of Sweden's Red Cross planes equipped to land on the snow.

carrying the sick to the military hospital in Boden, has since saved the life of someone living in the严寒 of winter. Similar services have also been extended by ambulance planes operating from Östersund, to the north, and for those who live in the most remote areas of the Swedish domain.

Recently a public-spirited citizen of Boden made a donation of 50,000 kronor to further the Red Cross work in the far north. Other gifts have also been received. This has been plied for the construction of a new ambulance plane, modern in every detail, to supplement the Regent army plane with which all the pioneer work around Boden was accom-

plished. The latter will be retained, however, for a much-needed supplementary service.

The pilot encounters many special problems in the Arctic regions. For winter flights the plane is equipped with skis. Weight in winter lasts only two or three hours at the most. When a cold comes in to Boden, or Östersund, it may require a flight of from four to five hours or more over thick snow-fields.

In the summer quite different problems arise. A plane provides very facilities for landing either on water or on land without many difficulties. The usual landing is on the wide expanse of one of the Swedish rivers. However, at times they are filled with large drifts of timber floating down to include factory or saw mills, for Noreland is the great forest region of Sweden. Farther north, where the mid-night sun shows uninterrupted day and night for weeks, the pilot



Transferring an injured man aboard a Swedish Red Cross Ju 52 aircraft air ambulance.

must occasionally perform fly day and night, only to be blinded by the blinding brilliancy of the sun glowing for hours past the horizon's edge.

Often this Red Cross work, maintained principally for exports of cereals, means an appeal to someone who has raised all other propaganda and discussed the regular passenger flying as passengers or at best an unnecessary luxury. In fact, the ambulance plane has even compared the trend toward of the normal Lapp following his reindeer over the snowy meadows. At first the Lapp ran on tracks from the flying school. Now, however, they have been brought by plane to the hospital in Boden, and given the privilege to return by the air route when they are well again.

Finally, through a safe and comfortable passenger service and through this Red Cross work, Sweden has been showing the concept of good will in the sky. The country has an unusually extensive system of waterways, and its railway system is more comprehensive, in proportion to population, than that of any other European country. Despite all this, and with no supplements other means of transportation. Even before the first season was ended, it was clear that the project had passed from the experimental stage to a punctuated line of flight toward a slow but consistent development.

### The Langley Field Maneuvers

Continued from page 1365

The markers, with their nose of four men and their machine gun and rifle, are representative of extremely heavy fire from an attacking plane. The theory is, that if a landing at the marker can be made, and the weight of the weight of the four men can be distributed over the upper works of the plane, then it is reasonably safe. The present planes attained more than 100 miles. But always they circled above the markers to



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## "Oh Boy! What Performance!"

**T**HIS Enthusiastic Comment in a recent letter from the West Indies Aerial Express, refers to the Keystone Pathfinder 3-Engine Transport — De Luxe 10-Passenger Air Liner (shown above) which links The Historic Islands of the Tropical Atlantic.

"225 Hours without any major repairs" — "Never Miss a Trip" — Such Superlative Performance by a Large ship can only result from Careful Design, Superior Workmanship and the use of High Grade Materials.

Yet it typifies the service obtained by all users of Keystone planes.

The latest Pathfinder model — built around the Air cooled "Panther" bomber — is now under construction, and promises to become the sensation of the 12,000 pound class. It, too, is propelled by 3 radial Aircooled Engines.

*Full particulars  
fully furnished interested  
operators on request*

## Keystone Aircraft Corporation

BRISTOL, PENNSYLVANIA

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words, the Vee engine was cut into three sections, these sections of four cylinder Vee engines being joined to make four 220 deg. apart, positioned in a low new radial type engine case, one now closely behind the other. By this means the rear end of the exhaust Vee in each of the two Vee Vee engine cooling was obtained.

The feature of the low weight per horse power of a Vee engine was partially minimized, as there is no question that a single row radial is the lightest form of engine of a given rpm., and displacement that is known today. However, increasing the engine crankshaft speed thus decreases weight. However, the load resistance was kept very low in engine outside diameter being 45 in., and the cooling diameter 36 in., which results in high propeller efficiency in the ratio of the diameter of the propeller to the diameter of the engine becomes larger than on the big radial engines, leaving the propeller tips in clear unobstructed air in a symmetrical form around the engine. In fact, the propeller is free to turn when operating in front of a symmetrical body that would behind a form of engine such as the inverted Vee, produce of course, a very strong air flow in the engine. By use of the small diameter and a short engine very light weight was obtained. With six cylinders in a radial we have six large gears, 90 deg. between each cylinder but which permit visibility as obtained on a 29 in. diameter and the 45 in. diameter prevents only at the overhead valve movement which extend for only a very short part of the cylinder and are streamlined easily.

With only six cylinders on a revolution the weight of non-moving parts was greatly reduced permitting higher crankshaft speeds. Overhead valve gear center to design is in 40,000 rpm gear set used which again permitted the higher crankshaft speeds. The obvious arrangement is exactly the same as on any Vee engine with the addition of an extra row of exhaust ports at the bottom of the engine which can be manifoldled with a muffler in a single row to the two side and bottom adding practically no head resistance and no need of cooling with radiators.

The cooling air to the cylinders can be generated as in the Vee engine. Reduction gears of either the conventional fly or the spur type can be used. The latter possibility being very great advantage in that it can be used with any engine and any other form of engine without interfering with cylinder cooling or increasing the frontal area of the engine as would be the case on the inverted Vee engine should the reduction gear or the spur type be placed above the crank shaft center line.

The application of the spur gears in this way as is favored by Vee engines would also entirely rule the visibility from the pilot's cockpit. The spur reduction gears would not interfere with cooling or visibility on the Breguet engine as they would pass the center of the propeller shaft giving an clearance for the propeller which otherwise would be kept in diameter of one at a slower speed.

The overall length of the Breguet type of engine is only about 87" more than the single row type which is a considerable figure when the installation in an airplane is considered. There is also an opinion that the larger the bore the less of an effort as in starting of this power the smoother the operation of the engine will be.

Twin cylinder torque has been demonstrated actually to be very much more satisfactory than the torque from a smaller number of cylinders of the same size when the engine is run at the same crankshaft speed.

It is not possible to completely balance the twin cylinder radial engine or any other single row engine using a criss-cross type of rods. These engines do not run as smoothly as the 12 cylinder, but they have been found to be substantially

so. The balance of the articulated rods on the Breguet type is perfect, assuming as one row of the cylinders completely balanced and the other row of cylinders as the opposite crank throw and it was only necessary to put enough balance weights on the crankshaft to take care of the unbalanced couple existing.

The above outline describes roughly the arrangement of the engine, however, a few details making this construction possible are given below:

The cylinder construction is of the conventional type with the exception that a four valve flat head cylinder is used similar to the water cooled Hispano engine. Bore and stroke are inserted in the aluminum cylinder head and the steel cylinder is inserted in the aluminum head in the usual man-



Side view of a Curtiss "Pioneer" showing the installation of the Curtiss "Chiefline" engine.

er. Each cylinder on a bank has a large pilot on the top and which fits into a casting bridging the two cylinders. This casting is held in place with studs and nuts and carries the double crankshaft bearings. The two crankshafts on each bank of two cylinders are driven by spur gears at the propeller end, and one of these spur gears being mounted as an idle shaft below the two crankshafts. The idle shaft is driven through gears and a master gear as the front end of the crankshaft, all of the vertical shafts being driven from this master gear. Each pair of crankshafts has a revised face sweeping for maximum adjustment.

The crankshaft, which is a two throw, 180° crank, is mounted in two Name-Baldwin roller bearings one at each end. The center main steel backed ball-belt-lined bearing is mounted in a large split bearing housing support which is large enough to clear both crankpins enabling the shaft to be dropped into the maincase which is of the barrel type. The engine is split at right angles 90° to the crankshaft, the two rows of six cylinders being bolted together on radial frames on the inside of the maincase behind the cylinders are put in place. This gives a very clean exterior construction and the external flange forms a support for the radial main bearing.

The main price on this engine requires only the cluster of head cover for driving the crankshaft, and the oil pressure system. The flywheel is located at the free end of the engine for the purpose of accessibility and permits the use of an oil seal for forcing oil into the crankcase for lubrication purposes. A large deep groove ball bearing for both radial and thrust purposes is used at the forward end of the nose of the engine on the crankshaft.

The connecting rods are of the split type, very carefully



Truscon Hangar for the Fairchild Aircraft Manufacturing Corp., Farmingdale, L. I.

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longitudinal tests of the PN-12, the latter can be operated in service at a much higher gross load than the above, which will increase the useful load accordingly. Based only on the loads, however, the useful load has been increased 50 per cent, even though the P-34a and PN-12 have 40 per cent of the gross weight. The increase in useful load is due to a combination of lighter weight, due to metal construction, and the use of a gross increased aerodynamic efficiency, and increased engine power. At the same time there has been a considerable increase in the load supported ratio of the weight empty, due to additional navigation, electrical and other equipment.

The passenger area of this plane consists of four seats as follows: Pilot, navigator-instrument panel, two passengers, plus baggage. In wartime, however, the crew would be increased to at least five, in order to properly handle the armament provided, which is as follows: Bomb racks capable of carrying 4,000 lbs. of bombs of various sizes up to two 1,000 lb. bombs and gun mounts for six Lewis machine guns, two in the forward cockpit, two aft and two in the side aft.

This plane is designed so that it can readily be fitted with extra fuel capacity so that it is desired to use it as a long distance search plane, in which case most of the armament weight would have to be removed. During the pre-battle trials, it has shown that the plane can readily take off with 17,000 lb. gross load. Experiments with the PN-12 and consideration of load factors show that this can be done, with safety. This would allow an extra load of about 450 gal. of gasoline, or 1,000 gal. in all, with which the endurance at a long distance work should be about 87 hr. and the range about 3,000 mi. at cruising speeds. Trials are now being conducted to obtain accurate data as to these performance.

**Editor's note.** Since the writing of this article, the PN-12 has established a new world's endurance record for monoplanes

Information concerning this record flight is contained in a new article printed in the news section of this issue.

### Chassis Analysis

Continued from page 1267

36 x 8	18,000	56	7.25	4.00
44 x 10	22,000	132	10.0	5.25
54 x 12	28,000	135	12.0	4.00

#### Shock Absorber System

The simplest method of taking shock loads is by the absorption of shock load. Up to a few years ago this was the only method employed, and it is still widely used. A load-absorption diagram for shock absorber shock load is given in Fig. 47.

Many companies are now making side and other-pneumatic shock absorbers for aircraft use. These are however, the shock load system, but they are much better for a shock absorber and maintenance qualities are. The first the load factor may be decreased 55 per cent, with the shock absorber that they absorb the shock more effectively. The use of a lower load factor will also save some weight in the struts and possibly the wheels and their components for the extra weight of the shocking system.

#### Chassis Analysis of Conventional Beam-Cantilever Monoplane.

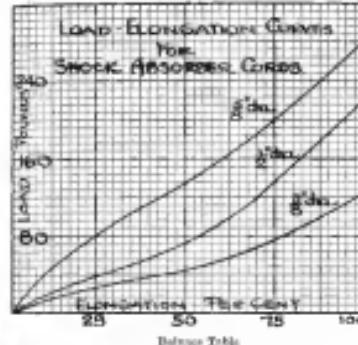
The gross weight of the plane, the chassis weight, and the position of the center of gravity of the plane are used in the chassis analysis. The first thing to do then is to list the

May 14, 1938

AVIATION

rights and figure the center of gravity of the airplane. A simple installation diagram of the plane should be made, indicating of each item placed as nearly as possible, and the location of each part measured off and listed as in the following table. The propeller axis is horizontal and all measurements are made parallel or perpendicular to it.

Fig. 47



Balance Table

**Horizontal Axis** measured from front face of rear propeller blade

**Vertical Axis** measured from front face of rear propeller blade

**Horizontal Arm** measured from front face of rear propeller blade

**Vertical Arm** measured from front face of rear propeller blade

	Vertical	Vertical	Horizontal	Horizontal	
	Arm	Measured	Arm	Measured	
Propeller	65	0	0	-105	
Engine	368	0	0	2988	
CG & Tank	45	-16	-460	32	1448
Total Weight					
Prop	56	16	560	42	3200
Engine	165	6	0	65	16,300
Gears	138	-30	-9800	60	7800
Gas & Tools	336	-35	16,000	30	26,400
Wings	355	32	11,300	94	26,300
Propcase	220	-5	-600	60	21,200
Passenger	3	-7	-220	80	33,000
Baggage	560	41	-210	200	16,200
Total	16	-15	-100	580	28,800
Total Vertical	59	22	500	317	15,000
Total	310		-12,000		36,3400
Vertical position of CG	=	163,000/2218	= 73.06 in. back of prop. blade		
Horizontal position of CG	=	163,400/2218	= 73.06 in. back of prop. blade		
Location of Wheel Axis					
Vertical Position	=	-45 in. below third seat			
Horizontal position	=	50 in. behind prop. blade			
Distance between CG and 3rd seat					
Vertical = 5.95 + 55 = 50.90 inches					
Horizontal = 73.06 - 50 = 23.06 inches					

Distance of C.G. from front face of rear propeller blade

Distance between CG and 3rd seat

Vertical = 5.95 + 55 = 50.90 inches

Horizontal = 73.06 - 50 = 23.06 inches

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Horizontal = 73.06 - 50 = 23.06 inches

Distance of C.G. from front face of rear propeller blade

paned horizontally at the lower longitudinal, the long, shock absorber strut extends to the upper longitudinal where it is also paned horizontally. At the landing gear, the chassis pivots outward about the lower longitudinal so the struts encounter static deflections. An elastic chord absorbing system is used. The struts are 38 x 4 inches as these are the smallest wheels strong enough to take the required loads.

Fig. 68 is a free body diagram of the chassis after the shock absorber strut has compressed 4 inches. The analysis must be made with full load on the shock absorber, that is maximum

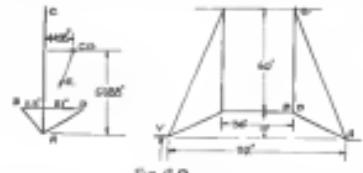


Fig. 68

compression or tension of the shock absorber, unless a partial deflection gives more static loads in the struts. Usually maximum deflection is the worst condition and most chassis are analyzed for that case.

Fig. 70 is a free body diagram of the three-point landing condition. The chassis shock absorber strut is compressed 4 inches and the main strut absorber is stretched 4 inches—its full amount.

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May 14, 1938

Table of Struts.

Member	T	D	S	31	32	33	34	35	36	37
Front Strut	21	21.8	18	31.8	31.8	31.8	31.8	31.8	31.8	31.8
Front Wheel	21	21.8	18	31.8	31.8	31.8	31.8	31.8	31.8	31.8
Front Wheel	21	21.8	18	31.8	31.8	31.8	31.8	31.8	31.8	31.8

In the equilibrium condition of the chassis it will be necessary to use the components of the struts in the vertical, drag and

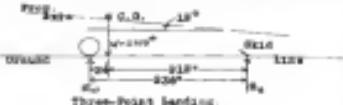


Fig. 70.

use plus or minus reference.

They will be listed in the table below for ready

use.

Components of Struts.

Member	Length	V/L	D/L	S/L	
Front Strut	32.8	49.0	35.6	65.1	AB
Altimeter Strut	30.0	33.0	33.0	33.0	AB
Front Strut	26.1	39.4	35.1	72.5	AB

Relations of Chassis for Unit Loads.

Unit vertical, drag, and horizontal side loads will be applied to the chassis structure and the loads in the struts determined. The actual loads in the struts will then be determined by multiplying the stresses due to the unit loads by the true vertical, drag and side loads.

At the point A the three struts meet. As we do not know the load in any of the struts, we have three unknowns and

one. However the point A must be in equilibrium and therefore the summation of all the vertical forces must equal zero, summation of all the drag forces must equal zero, and summation of all side forces must equal zero. These three conditions allow us to take three simultaneous equations, the solution of which will give the unknown loads in the struts.

From the equations it is assumed that the loads are acting in the axis of the struts at point A. It is really the loads in acting at a distance from point A and are producing bending moments at this point. This bending moment will be the sum of three independent.

From the equations below, it is to be borne in mind that the type of strut in the members is unknown. It is decided assumed that they are all in tension. If the answer does not agree after solving the simultaneous equations it indicates that the strut is in compression. Forces acting to the rear, upward, and inward are considered positive.

Equation for Unit Vertical Load.

$$\text{Equation V: } 356AB + 356AC + 356AD = 1 = 0 \quad (1)$$

$$\text{Equation D: } -356AB + 0AC + 356AD = 0 \quad (2)$$

$$\text{Equation II: } 356AD + 356AC + 356AB = 0 \quad (3)$$

$$\text{Multiplying Equation (1) by } 356/356 \text{ which is } 1.000:$$

$$356AB + 356AC + 356AD = 1.000 = 0 \quad (4)$$

$$\text{Subtract Equation (4) from (1):}$$

$$-356AC = 1.000 = 0$$

$$AC = -0.356/1.000 = -0.356 \text{ lbs. (Compression)}$$

$$\text{Subtracting } 356AC \text{ in Equation (2):}$$

$$356AB + 356AD = 1.000 = 0$$

$$AB = -0.356/1.000 = -0.356 \text{ lbs. (Tension)}$$

$$\text{Equation II: } 356AB + 356AC + 356AD = 0 \quad (5)$$

$$\text{Substituting for AB in Equation (2) and solve for AD:}$$

$$356AB + 356AC = 0 \quad (6)$$

$$AB = -0.356/0.356 = -0.356 \text{ lbs. (Tension)}$$

$$AD = 0.356/0.356 = 1.000 \text{ lbs. (Tension)}$$

Equation for Unit Drag Load.

$$\text{Equation V: } 356AB + 356AC + 356AD = 0 \quad (1)$$

$$\text{Equation D: } -356AB + 0AC + 356AD = 1 = 0 \quad (2)$$

$$\text{Equation II: } 356AB + 356AC + 356AD = 0 \quad (3)$$

$$356AB + 356AC + 356AD = 0 \quad (4)$$

$$\text{Subtract Equation (4) and (3):}$$

$$356AB = 1 = 0$$

$$AB = 1/356 = .0027 \text{ lbs. (Tension)}$$

$$\text{Equation II: } 356AB + 356AC + 356AD = 0 \quad (5)$$

$$\text{Substituting for AB in Equation (2) and solve for AC:}$$

$$356AB + 356AC = 0 \quad (6)$$

$$AB = -0.356/0.356 = -0.356 \text{ lbs. (Tension)}$$

$$AC = 0.356/0.356 = 1.000 \text{ lbs. (Tension)}$$

$$\text{Equation II: } 356AB + 356AC + 356AD = 0 \quad (7)$$

$$\text{Subtracting } 356AC \text{ in Equation (6):}$$

$$356AB + 356AD = 0 \quad (8)$$

$$AB = -0.356/0.356 = -0.356 \text{ lbs. (Tension)}$$

$$AD = 0.356/0.356 = 1.000 \text{ lbs. (Tension)}$$

$$\text{Equation II: } 356AB + 356AC + 356AD = 0 \quad (9)$$

$$\text{Subtracting } 356AD \text{ in Equation (8):}$$

$$356AB + 356AC = 0 \quad (10)$$

$$AB = -0.356/0.356 = -0.356 \text{ lbs. (Tension)}$$

$$AC = 0.356/0.356 = 1.000 \text{ lbs. (Tension)}$$

$$\text{Equation II: } 356AB + 356AC + 356AD = 0 \quad (11)$$

$$\text{Subtracting } 356AB \text{ in Equation (10):}$$

$$356AC = 0 \quad (12)$$

$$AC = 0 \quad (13)$$

$$\text{Equation II: } 356AB + 356AC + 356AD = 0 \quad (14)$$

$$\text{Subtracting } 356AD \text{ in Equation (12):}$$

$$356AB = 0 \quad (15)$$

$$AB = 0 \quad (16)$$

$$\text{Equation II: } 356AB + 356AC + 356AD = 0 \quad (17)$$

$$\text{Subtracting } 356AC \text{ in Equation (16):}$$

$$356AD = 0 \quad (18)$$

$$AD = 0 \quad (19)$$

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Stress = (2) for AD. =  $366AB + 9 + 2811 - 681 = 1$   
 $AB = -(366 \times 694)/289 = 660$  lb. (Group 1)

Stresses on Struts for Unit Loads.

Stress for Member	Stress for Unit V	Stress for Unit D	Stress for Unit E
Front Strut AB	+364	+141	+36
Aftwise Strut AC	-133	0	-136
Base Strut AD	+228	-131	+364

+ indicates tension — indicates compression

The next 11 stresses are listed plus or minus because the information may not be in order. Our equations were based on the forces acting on AB. If we had success in getting out, the sign of stress on the struts would have been reversed but the same amount.

### Binding in Axle.

The front strut AB is usually termed the axle of the plane. It is a continuous member from the point where it is placed at the fuselage right out through the hub of the wheel. The shock absorber on AC and the rearward strut AD are placed with this to give the axle and at the front. These are therefore unable to take bending and the axle must take it all. When the axle is pushed forward as it is in our plane it is subject to tension as well as bending stresses but this is usually neglected on small planes.

There is a bending moment imposed on the axle due to the fact that the loads on the wheel act at the center of the hub which, in our plane is 4 inches out from the strut joints. The vertical and drag forces are applied at this point. The axle acts 12 inches below the axle and it also puts loads in the axle. When the vertical force is acting up, as it always does, and the axle force is acting out, which conditions are



Fig. 159.

being investigated, the moments due to the two forces are added together. The bending and the compressed loads in the analysis of the various conditions. It is to be remembered that the moment arm is 4 inches for the drag and vertical loads, and 12 inches for the axle load.

On analyzing this diagram for a unit load we find that it is right at the strut joint. What we really desire is a diagram on Fig. 160 for a vertical load. The actual load V acts at the center of the hub which is replaced by a single couple V<sub>0</sub> and a force V at the strut joint. Now, however, the single V<sub>0</sub> response a reaction in at the fuselage to balance it. The amount of this reaction is V<sub>0</sub> sin 25°. Thus, to balance the vertical forces, we must have a reaction of this same amount, V<sub>0</sub> cos 25°, acting at the strut joint. The two forces V<sub>0</sub> at the fuselage and at the strut joint are a set of forces just equal the couple V<sub>0</sub>. This is easily obtained by multiplying the reactions by the distance between them. V<sub>0</sub> times 1 equals V<sub>0</sub>, which is the value of the couple V<sub>0</sub>.

It is then apparent from the figure that we actually have two vertical forces V + V<sub>0</sub> sin 25° acting at the strut joint. In other words we called this a force of 3 pounds and solved. We

and now increase the stresses obtained in the struts by multiplying it by V + V<sub>0</sub> in which V is the vertical component of the design load for whatever condition we are applying. A similar multiplication must be made for the stresses due to the drag, namely, D + D<sub>0</sub>. It is evident from all that for our plane  $a = 4$  and  $b = 28$ . Then to obtain the true design loads at the strut joint we must multiply the V and D components of our load by  $(1 + a/b)$  which is  $(1 + 4/28) = 1.1342$  and 3.4432.

In the case of the side loads, we have just calculated above that the moment arm of the wheel is 22 inches. This is equivalent to the quantity  $a$ . For the side force, b is measured vertically from the hub of the wheel to the bottom of the fuselage where our side strut joins. Referring to Fig. 160 the distance is found to be 15 inches. The quantity  $(1 + a/b)$  in this is  $(1 + 22/15) = 1.8$ . That is, the design side load to be applied at the strut joint is 1.88.

### Level Landing Condition

Mass Weight of Plane ..... 2239 lb  
Weight of Crew ..... 159 lb  
Set Load on Crew ..... 2093 lb  
and Fuel (about 2500) ..... 6.5  
Drag Load on Crew ..... 23,523 lb  
Load per wheel = 13,529/4 = 3380 lb.

In the Level Landing condition the resultant force is assumed to act along a line through the axle and the center of gravity of the airplane. This line is labeled V in Fig. 161. The vertical component of this line is the force of 13,520 lb listed above. For one side of the plane it is half this value, or 6760 lb. The drag component of this resultant may readily be found. These:

Length of fuselage =  $\sqrt{24^2 + 34^2} = 43.0$  inches.  
Vertical Force =  $6760 \times 53.0/43.0 = 7660$  lb.

Drag Component =  $7660 \times 24.56/43.0 = 1560$  lb.  
Vertical Component =  $7660 - 1560 = 6100$  lb.

These components must be multiplied by 1.1343 to be applied at the strut joints. Their new values then are:  
Drag Component =  $1560 \times 1.1343 = 1800$  lb.  
Vertical Component =  $6100 \times 1.1343 = 6900$  lb.

Refining in Level Landing (After taking off bending in the plane)

Binding due to V load M<sub>V</sub> =  $7660 \times 4 \times 27,049$  in. lb.  
Binding due to D load M<sub>D</sub> =  $1800 \times 4 \times 7,935$  in. lb.

Resultant Binding Moment =  $\sqrt{7660^2 + 1800^2} = 7,935$  in. lb. since M<sub>V</sub> and M<sub>D</sub> are acting in planes at right angles to each other. This result could be obtained by multiplying the resultant load 7,935 lb by the moment arm of 4 inches. This is  $7660 \times 4 = 29,240$  in. lb.

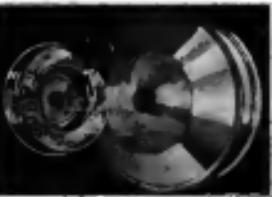
### Level Landing—Calculation of Struts in Struts.

Struts for Strut AD ..... 366 Struts for Strut AC ..... 366 Struts for Strut V ..... 366 Struts for Strut D ..... 366 Struts for Strut E ..... 366  
Strut AD ..... 366 Strut AC ..... 366 Strut V ..... 366 Strut D ..... 366 Strut E ..... 366  
Strut AC ..... 366 Strut V ..... 366 Strut D ..... 366 Strut E ..... 366  
Strut V ..... 366 Strut D ..... 366 Strut E ..... 366  
Strut D ..... 366 Strut E ..... 366

The V-component multiplied by the stress in each strut due to a high V-component will give the total stress on the strut due to vertical loads. The stress due to drag loads is given in the same manner. The V and D components above have been determined that their added effect will give the total load on the strut under the requirements of level landing. This is to be done in the above table, the stress due to the V-component being added to that due to the D-component and the result divided in the last column.

### Level Landing with Side Load.

In this condition the forces are the same as those in level landing with an additional side load applied at the ground. The side stress is defined one-half its nominal diameter. It is one-half this in 2 inches, as we are using a 2 x 24 x 4 inch



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wheel and 4 inches is the nominal diameter. The distance from the axle to the ground will then be  $28/2 = 14 = 12$  in.

The amount of the side force  $F_s$  to be taken as  $\frac{1}{4}$  of the vertical component in level landing. That is  $6700/4 = 1675$  lb. The force may be acting either in or out.

Design Side Load =  $1675 \times 1.6 = 2680$  lb.  
Level Landing with Side Load—Calculation of Struts

Strut Stress Stress Stress Stress

Member	Level Landing	Hi-Camp-Tire II	II	III
Front Strut AB	5631	3846	2769	2726
Afterburner Strut AC	16,280	3846	2713	2160
Front Strut AD	—	815	2846	2664
				—220

"Bending" on this strut is anticipated before  
+ indicates tension — indicates compression.

The stress on the struts due to the side load  $H_s$  is added to the stress on them in the level landing condition. As is planned before the plus or minus loads depend on whether the side force is acting in or out. To determine the stress in the strut, the sign is taken the same as the level landing condition and the two figures added. That is, above, 2680 is positive so plus 2680 is added to it giving 2922 lb. It is minus in the front strut. In the afterburner and rear struts the two negative quantities are added giving the total compression on the struts.

The bending moment due to the side force alone is

$$M = 1675 \times 12 = 20,080 \text{ in. lb}$$

At the end of the other struts, that has no bending was not combined with the bending stress on level landing. Now  $H_s$  and  $M_s$  are acting in the same plane as in the plane of the paper if we look at the front view of the chassis in Fig 20 as was explained before when  $H_s$  is acting out.  $M_s$  is added to  $M$ . Thus

$$M + M_s = 20,080 + 27,848 = 47,928 \text{ in. lb}$$

$M_s$  is acting on a plane at right angles to this moment. The resultant moment is then equal to  $\sqrt{47,928^2 + 27,848^2} = 50,000$  in. lb. This is the design bending moment in the side

Three-Pont Landing Condition.

In this condition the loads are divided between the chassis and struts and are inverse proportion to their distances from the center of gravity. Fig 20 illustrates how these stresses are measured.

$$\text{Strut load} = 2230 \times 212/236 = 1985 \text{ lb.}$$

$$\text{Strut load} = 2110 \times 212/236 = 1825 \text{ lb.}$$

Strut load on Chassis = 1880 — 180 = 1685 lb.

Load Factor = 1.5

Design load on chassis = 150,000 lb.

Load per wheel = 22,000/2 = 11,000 lb.

This load is acting straight up as shown in Fig 20. In applying our test loads and on the previous condition, the vertical was considered perpendicular to the propeller axis. Our force of 6,040 lb. is acting at an angle of 10 degrees with that vertical. We must then resolve the force into components perpendicular and parallel to the propeller axis to obtain true  $V$  and  $D$  components. Then

$$V = \text{Comp. } 6,040 \times \cos 10^\circ = 6040 \times 0.984 = 5951 = 2060 \text{ lb.}$$

$$D = \text{Comp. } 6,040 \times \sin 10^\circ = 6040 \times 0.174 = 1044 \text{ lb.}$$

It is to be noted that the D-Component was given a negative sign. This is because it is acting forward. The next deduction is that forward or negative  $D$  is the side load. We must then add the true load and the amount of weight on each wheel. We must then be certain to give the drag component its proper sign.

As in the previous condition analyzed, the  $V$  and  $D$ -components obtained above must be converted to obtain the true values. Then

$$\text{Design } V = \text{Comp. } 6040 \times 1.143 = 6703 \text{ lb.}$$

20-400 D-Camp. =  $1675 \times 1.143 = 1905$  lb.  
Three-Pont Landing—Calculation of Struts on Struts.

Strut Stress Stress Stress Stress Stress Stress Stress

Strut	N	W	W	W	W	W	W
Front Strut AB	5631	3846	2769	2726	2726	2726	2726
Afterburner Strut AC	16,280	3846	2713	2160	2160	2160	2160
Front Strut AD	—	815	2846	2664	2664	2664	2664

per side of the front strut to act as a strut in series with the front wheel.

The stresses on the front struts are

Front Strut AB =  $1675 \times 1.143 = 1905$  lb.

Front Strut AC =  $1675 \times 1.143 = 1905$  lb.

Front Strut AD =  $1675 \times 1.143 = 1905$  lb.

The stresses on the afterburner struts are

Afterburner Strut AC =  $1675 \times 1.143 = 1905$  lb.

Afterburner Strut AD =  $1675 \times 1.143 = 1905$  lb.

The stresses on the front struts are

Front Strut AB =  $1675 \times 1.143 = 1905$  lb.

Front Strut AC =  $1675 \times 1.143 = 1905$  lb.

Front Strut AD =  $1675 \times 1.143 = 1905$  lb.

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## FOREIGN NEWS

By Special Arrangement with the Transoceanic Service  
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### Progress Made With Italian Built Planes

Types of airplanes now used by the Italian Air Forces indicate that Italy is freeing itself from foreign aircraft supply. Though the country is still dependent on other nations for commercial planes, series of new types used in the Air Forces are of Italian make.

These series are: 1. Night bombers, Ca-33 Caproni biplane, twin engines; 2. Day bombers, Fiat B-1 with Fiat 780 hp engine; 3. Observation planes, Ansaldo AS.2 with Fiat A.22 280 hp engine; 4. Fighters, Cr.20, Fiat with Fiat A.28 400 hp engine; 5. Dive bombers, S.55, Savoia Marchetti type twin engine, LF.30; 6. Observation airplanes, S.55, Savoia, with LF.300 engine; 7. Pallets transports, Marchetti M.74.

The only types in service built on foreign designs are the Fiat 1 (Brewster) observation aircraft fitted with Jupiter 9B

engines, the Fiat 200 (Fokker) fighters from the design of the Koolhoven Fokker, the Fiat 300 (the Savoia), and the Fiat 500 (the Savoia), both flying over Königsberg, Germany, have passed field interdictional competition. The awards will be available until March 15, 1939.

A provision that no planes for duration flights less than 1000 km. and covering less than 900 kilometers, or about 500 km. less, be built in the radio. Marks such as those have been made in previous glider flights have to win the competition. These records must be attained.

Gago Aero Company Reports Progress

More than 180,000 mi., it is reported, were flown by Italian Corps planes of the Italian Air Corps during the first 10 months of 1937. According to the company's plans, approved in the national office, routes will be opened this year between Cagliari and Cagliari, a distance of 550 mi., and between La Maddalena, Kirchell, and Kangaroo, a route of some 820 mi.

### Americans in Italy Get News by Plane

Prints of the *Pavia Herald*, European edition of the *New York Daily Tribune*, from Paris to Berlin, by airplane has been inaugurated. News from home is thus brought to Americans in the Italian capital before issue of the day paper is issued. The planes arrive at Tempelhof Airport, Berlin, at 10:30 A.M., a saving of seven or eight hours on former deliveries.

### Edison Government Aids Air Line

The British Government is coming over a fund of 50,000 dollars, or about \$20,000, to the Lloyd Aereo Boliviano, an air mail and passenger company operating via Andes mountain passes between Cochabamba and eastern cities. Impressions made in the service in the interest of the country will be made with the fund.

### Non-Stop Paris-Berlin Service Inaugurated

Europe's longest commercial non-stop air service was recently inaugurated when 5 hr. 30 min. flights between Paris and Berlin were inaugurated by the Lufthansa and Germanair companies. These non-stop flights result in a saving of 12 to 15 hr. — non-stop express trains require 27 hr. to cover the distance.

### Canadian Airports in Shape for Summer

Many airports have been made by the Mayor of Edmonton, Alberta, and the City Clerk of Calgary, Alberta, that airports in their respective cities are now in good condition for the reception of visitors this summer.

# AIRPORTS AND AIRWAYS

Dallas, Tex.  
By Bruce F. Condon

Howard Woodall and C. W. Shaw, state distributors for the Travel Air, recently made a trip to the factory at Wichita, Kan., on OX-6 Travel Air. Woodall says the enrollment of students and the sales of planes are holding up well considering the unusually inclement spring season in Texas.

Arthur J. Reinhart, street commissioner of Dallas, at the first of the city officials to actually take to the air. Commissioner Harrelson has completed his flying course under the instruction of Local Harry Wellington. This is probably a lead for other officials to follow as it has been announced that district attorney William McCue will purchase a plane for the use of the district attorney's office.

The "Voice of the Skies," a one-engine Fairless equipped with a specially constructed radio transmitter and amplifier, recently made its appearance at Love Field. Built at the fuselage are three large speakers. A voice can be distinctly heard while the plane is circling at an altitude of 3,000 ft. The plane is being used for advertising purposes. Lee Goss, pilot; Lee Goodin, mechanic; Goo W. McCauley, inventor of the radio equipment, and Fredrik B. Bell, manufacturer, were present at the engine meeting of the Dallas Flying Club. "There are several who planned to leave Dallas but purchased Love Field as a permanent airport saying that it was one of the best looking fields they had ever seen.

Gen. William, oil tycoon, Texas oil and former war pilot, is to be married with Good & Foster of Dallas. Woodall and Good served during the war together and later both were associated with the Curtis-Skeeter Aeroplane Co. of Tulsa, Okla. Good & Foster have purchased a Ryan Brougham, powered with a Hispano, which will be used for passenger and

cross-country work. The plane was piloted in by Eddie Tolle.

Robert Knudsen, who has been an air mail pilot for the S.A.T. since the inauguration of the Dallas-Chicago route, left recently for Cincinnati where he will take charge of the new S.A.T. air mail operation.

The city of Dallas is in the process of acquiring the property of a former lumber field which will be used by the city's air mail transportation corps. Present plans call for the field to be issued just north of Love Field. This will separate the civilian and commercial flying activities and should be a great help to both.

Garden City, L. I., N. Y.

Out of a hasty start, with roundups beginning to split apart the 200 planes continuing the main Atlantic Coast, in on Gutherie von Hirschfeld, Capt. Clarence Knobell, and Lt. James Finnemore. They were supposed to be enroute to New York on May 10, 1937, so their departure at Love Field at 1:30 P.M. was somewhat anticipated. The Jews, on whom students were taking instruction, were all present for landings when the large plane was sighted. Finally a hundred people were gathered at Curtiss Field, but the crowd around the plane as soon as it came to a standstill.

Gen. Knobell, pilot, descended as many from his plane, but the barn remained in the bare stable while the plane was being refueled. Filled with luggage, the stable did not have as it could hardly be a very comfortable place for persons during the strenuous flight from Murray Bay to New York. The plane was a bright outfit of color. The Baron landed against the wall, adjusting his monacle. Boarded on a motor and road with intense interest a German newspaper—



Captain Knobell, Major Finnemore, and Baron von Hirschfeld, east-west Atlantic flyers, land at Curtiss Field, L. I., N.Y., in the Ford E-10A plane piloted by Fredrik Bokken. Only a few who know of the coming of the Germans were aware of the Tex-Mexfield Field, in the photo shown, on this unusual arrival in New York from Canada.

shortly took away from him. The remaining trip to Washington, however, had to be made by auto.

Chamberlain flew into Curtiss Field in a Farnsfield shortly after the Ford twin plane landed, but did not again.

Conrad, who started a new course of cross-country instruction in a Fairchild plane for the training, William Weston made the first instruction flight when the new course was

opened, N. Y.  
By Edward W. Koenig

Since its organization last fall the Cornell Flying Club has added to its already considerable interest in aviation at the University and in the community. The attempt of the Club to secure the services of an aeronautics source in the Mabley College of Engineering at Cornell University fell through because of the fact that the faculty was temporarily short-handed, but the fact that a professor is bright for such a course next fall. Although not yet named, Frederick Bokken's Elementary Aerodynamics course in the Department of Physics and Fred C. Upton's Aeronautics Engineers course in the School of Mechanical Engineering has been greater than in previous years.

At the winter meetings of the club it was possible to obtain a number of well qualified speakers on aviation topics. Among these might be mentioned G. T. Maitland, who described the principle of the Handley-Page shielded wing; Professor Spain, who spoke on "The History of Aviation Engines"; and Prof. F. O. Morrison, who discussed and illustrated some phases of aviation engine development. Professor Upton has closely connected with the development of the University engine during the War, while Professor Morrison was in charge of the aeronautics engine section of the ground school at that time. As a matter of interest, the ground school at Cornell was one of the first to be started after America's entry into the war. Bokken is also the house of the Thomas-Morse plane which our warbirds have known so well. W. E. Thomas of the Thomas-Morse Aircraft Corp., has accepted the invitation of the club to speak at its next meeting.

Elmira, N. Y.  
By Ruth Grundahl

Alfred E. Stanley, head of the Stanley Airways, Inc., of the city, commercial operator, has purchased his new Waco 10 for use during the summer at the Elmira Airport. He expects to sell the Waco 10 which he purchased last summer Ralph Haynes, Mr. Stanley's pilot, flew the plane from the Alfred Aircraft Co.'s plant at Troy, N.Y., to the local airport.

The Southern New York Flying Club, recently organized, has adopted the "Gospert System" of flying instruction, used by the U. S. Army, for the training of its student pilots. Several business men have joined the club to take advantage of special rates offered for the use of planes. Edward A. Morris is temporary president of the organization.

"Air Mail Week" will be observed in Elmira during the last week in June in order to create sufficient interest in air mail to warrant the placing of this city as one of several proposed routes. Plans are now under way for bringing nationally known firms to this city.

Spokane, Wash.

An aerial insurance of the Spokane portfolio has shown substantial increases each month this year, according to figures recently compiled by Thomas J. Smith, underwriter.

In January 1937 pieces of air mail, weighing 150 lb., were sent in. In February 1937 pieces increased to 210 lb. pieces, and 175 lb. in March 1937 pieces increased to 200 lb., and in the first 15 days of April 420 lb. pieces and 100 lb. "These Sundays on the



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Air mail rates 3-23-388  
Arrived BOSTON, Ma. 3 Sept. 13.  
Boarded 10:00 P.M. Boston  
Arrived Boston 10:00 A.M.  
Flight time 10 hours

### FLIGHT RECORD

From Boston to Boston, Mass.  
Air mail rates 3-23-388  
Arrived BOSTON, Ma. 3 Sept. 13.

Arrived Boston 10:00 A.M.  
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First 15 days of April kept the figures down, but in both gas and gasoline the month is expected to better the previous figures.

Two more Waco 10 airplanes were sold recently by P. K. M. Maser of the Master Flying Service, Spokane, who is the Spokane agency for the Waco and Ford type planes.

Both of the planes were purchased by Pacific coast oil mineral flying organizations, one of them being the West Air Flying Service and the other the St. John Air Service from Chehalis.

### Centralia, Wash.

Work of grading the new Centralia, Wash., airport is being started. Plans for the new field include a number of a hangar. The Devil Brothers, graduates of the Basic School of Flying in Portland, Ore., anticipate establishing a school at the new field.

### Toledo, O.

By David E. May

Richard Wall, president of the Toledo Transfer Co., a member of the National Safety Council, recently returned from a nation-wide trip in the New York American's Blue Monocle "Dob" in search of demand now by leaders and other organizations.

"Aviation—The New Industry," was the subject of a dinner before the young manufacturers dinner on the chassis of commerce by C. H. Keya, president of the Curtis Aeroplane and Motor Co. Keya formerly was an official of Willys-Overland Co. and is highly regarded as a speaker on manufacturing subjects.

The Toledo Times-Commercial Airport is located on the south side of the village of Woodlawn, O., and one mile west of Toledo. This date has caused the former village to desire that the field be designated as "near" Woodlawn. No change of name has served formal notice of the project as it now exists in the vicinity.

Pilot G. F. Hagen, operating on the Toledo air mail route between Toledo and Cleveland, was forced down to have a late night Oshkosh, Ohio, emergency. He was carrying 2200 miles of mail and two tons of mail. A safe landing was later taken off his route. The mail was forwarded by mail to Toledo.

Woodlawn, O., a small city on the Lake Huron Toledo and Cleveland, will paint the name in 14 ft. letter atop the Citizens Service Bank building there. An advertising space also will be painted on the roof.

Harold E. Modl, chief pilot for the Becker Flying Co., spent several days here mapping the downtown and other districts for his company.

One of the large Fokker planes now being completed at New York for the Western Air Express will stop at Toledo on its way to California, it was announced recently.

### Cincinnati, O.

By Charles E. Pierce

Several models of the Eshky-Biddle Co. at Lakewood Airport, here to the All-American Aircraft Show at Detroit and during the week, Eshky-Biddle planes carried 2000 enroute visitors to the show.

The Ryan Douglas and the Bissell Destroyer biplane of the company were kept busy all week ferrying company men and fans to Detroit. Other Eshky models made trip with two passengers in a Whitehead Waco single plane. Jim P. Biddle, Stanley C. Hartman, and Warren Voss piloted the other planes. Students in the Eshky-Biddle Flying School were all urged to attend the show and eight rated biplane

Glennco was well represented at the show, a special team of 30 because even making the trip to Toledo

May 14, 1928

AVIATION

glow coils. They comprised the official recognition of the four Cessna firms represented at the show. These included Lehigh engine exhibit, with three of its new radial air cooled engines, as well as the International Aircraft Corp., with a six-cylinder and an open job on the floor, the New Haven Engineering Co. (Cessna), and the Eshky-Biddle Flying School.

The Cessna firm declared the show a fine success, advertising model at every one of the Cincinnati companies' displays.

Those interested around by the essay contest, for which a first prize was given free to Miss Marion Taylor, West Texas newspaper woman, for the best essay on "Why I Want to Learn to Fly," some 380 new students have been enrolled

in the Eshky-Biddle Flying School.

### Cleveland, O.

Announcement was recently made of a new municipal lake front airport to be constructed for the City of Cleveland in the near future. The site for the new airport will be the tract of land reclaimed from Lake Erie by the New York Central and the Pennsylvania railroads which is soon to be exchanged for another tract of land belonging to the city. The airport would be located virtually in the heart of Cleveland.

The new airport covers more than 60 acres and runs on a line 1000 ft. north of and paralleling the government breakwater. The new port will provide runways of 2,000 and 3,000 ft. in length.

Rock Park Airport will be further developed, Manager Hopkins stated, to handle the bulk of the city's aerial traffic in connection with the new airport.

### Detroit, Mich.

By John T. Neill

William S. Brock and Edward F. Sibley, co-pilots on the flight of the "Pride of Detroit" to Tokyo, Japan last fall, flew the "Pride of Detroit" to the Manhasset convention recently held in Manhasset, N.Y. Other members of the plane on the return flight were Dewey E. Sibley, brother of "Ed"; Jason Baskett, Jr.; M. A. Danvers, and Louis Ross, all of Detroit. The engine of the famous Detroit aeroplane, which flew across the Atlantic in a single plane, was given to the Manhasset.

Marion Taylor, 22, a young air maid of the Detroit Free Press, winner of the flying contest offered by the Eshky-Biddle Flying School, Cincinnati, during the All-American Aircraft Show here, plans to learn to land at London Airport, Croydon, soon to begin taking instruction. She plans to spend about two months taking the course and will return to Detroit at the end of the newspaperwoman's vacation in the city. Miss Taylor won the flying contest by writing an essay on "Why I Want to Learn to Fly."

### Niagara from the Air

Negotiations are said to be under way whereby Street Air Service, Inc., of Detroit, will undertake operation of Niagara Falls, Inc., as an airmail marketing project organized for the marketing of Niagara Falls. Operations will begin about May 30. The new company has ordered a limited fleet consisting of two Ryan Douglas, one Ryan Bissell, William E. Stroh, E. L. Woods, and James E. DeVoe, all of Detroit, and Fred J. Clegg, of Milwaukee, Calif., N.Y.

Edward B. Evans, chairman of the Board of Commerce Newark, N.J., has left on a month-long airplane buying trip through the South and West. Mr. Evans expects to visit cities in Missouri, Oklahoma, Texas, Arizona, California, Oregon, and Washington before returning to Detroit about May 30. Jack Fries will pilot him in a Glidden monoplane belonging to the "Wise Birds" organization.

Carl B. Frisbie, general manager of the Aircraft Develop-

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Paterson High School, Paterson. He spoke on the opportunities for young men in aviation.

The Union Trust Building management has placed a 20 x 60 steel marker on the roof of their building. The marker is used to be plainly visible from an altitude of 5,000 ft.

### Portland, Ore.

By John B. Anderson

May 13 has been set by J. G. "Tex" Rector as the date for the start of regular airplane passenger and express service between Portland and Takoma, Wash. Plans call for round trips six days a week. The two biplane companies of the Western Flying Service will be used on the route.

The Portland Chamber of Commerce is actively supporting the venture. Letters have been mailed out to all members of the city, asking them to patronize the line.

Twenty-five graduates of the MacKenzie-Gaff Aviation School in Portland have agreed to pay the cost of a square bales of straw necessary to qualify for the required pilot's license. The men will start about \$100 each with which to buy a plane. Costs of operation are to be paid by the men. With this plane they hope to pile up all the hours of flying needed.

Tex Rector plans to start two or three planes in the serial order to be staged at Wells, Wells, Wash., May 18 and 27. Passes aggregating \$1000 are offered.

The Tacoma Airways Co. of Tacoma, Wash., the Gas-Harbor School of Aviation, Aberdeen, Wash., and the Loring School of Flying, Pittsburgh, Pa., have adopted the Rector system of flying instruction, according to J. E. Keggin, general manager of the Rector School.

Capt. Frank Meissel, mapping expert for Continental Airways of Portland, has been busy mapping a large tract of land for California lumber company. He works in a biplane autoplane piloted by Capt. Gordon H. Meissel, chief pilot and general manager of the company.

### Rosedale, Ohio.

Oregon Agricultural College experts have been called as consultants on plans for the new flying field at Rosedale, Ohio, for which 800,000 acres of land were sold recently. F. E. Price, soil specialist, is studying the ground on the site with a view to recommending proper drainage facilities and the best variety of grasses for sodding. The college will be called upon for other technical advice.

### Oklahoma City, Okla.

John Modern, president of the Midland Air Lines Co. in Los Angeles, was in Oklahoma City recently on a business trip with his wife, Lucy Flata, J. Miller, Mr. and Mrs. A. A. Aiken, and Mr. and Mrs. J. L. Kerwin of Los Angeles. Modern, while here, spoke of plans to establish an air line between Los Angeles through Oklahoma City.

H. C. Martin of the aviation committee of the local chapter of Congressmen has announced that radio equipment for handling the weather reports and auxiliary flying service will be installed at the airport by July 1. H. W. Parker has been named as special airway observer.

H. W. Tashjian, Oklahoma City sales representative of the Alexander Engineering Co. has been selling many planes in this territory.

Three hundred employees of the McElroy Halligan Co., local drygoods concern, were given free rides on the local airport to planes of their firm. McElroy's boats were provided for the passengers, the event being in charge of John McGeary of the company.

The Central Air Club has been informed at Central High School and is building model airplanes at one of its principle

May 16, 1928

schools in one of the several training rooms of the high school every Wednesday afternoon with Paul Bell, electrical radio amateur, and G. A. Parker as sponsors. The radio club members are: W. E. Bell, Harry, G. G. Gurnett, Jack Pekkan, Robert Morris, George Thomas, Maxine Collier, Bill Stover, Ed Key, Eddie Hansen, Paul Sheeder, Percy Gralla, Jacob Renn, Dan Landay, Gerville Mills.

### Omaha, Okla.

Omaha is another one of the enterprising small towns of Oklahoma that is placing on development aeronautically. Small towns of Oklahoma have nearly all risen to the occasion of aeronautical development. Duncan being one of the first to do so.

The city has recently acquired a municipal airport of 40 acres of land adjoining the fair grounds just south of the city. These 40 acres were bought at a price of \$169 an acre, it has been reported.

Passes, having bought in air field and equipped it, is now looking for a place in the state for tour. See F. S. Hayes in column on the aviation committee of the Duncan Chamber of Commerce, and has been very active in all aeronautical work.

### Robert, Okla.

The chamber of commerce here has signed a five year lease for a 25 acre tract to be used for an air field, and work has just started on the field to condition it for the state air tour of the Oklahoma State Chamber of Commerce which is to come in October about May 15. Two planes are owned by Robertians and three more have been ordered. Plans are now under way to make the new field the master terminal by the Department of Commerce for temporary landing fields.

### Redwood Heights, N. J.

Report on the activities at the Teaneck Airport for April shows a decided increase in air traffic over that of the previous month.

During the month, 43 airplanes utilized the airport, 33 civilian aviation firms, and 16 departing for, and 16 returning to the United States and Canada. In all, they carried 26 passengers, in addition to baggage, freight, parts, etc.

In order to meet the ever increasing demand for big planes to accommodate so many students, the Glaser Flying Corps and Flying School, which operates daily at the airport, has engorged its fleet of aircraft by two new "Champions."

Not listed on the above report are the many small skip boats used in the field by the Fisher 22 passenger plane, biplane engine monoplane recently built by the Atlantic Aircraft Corp., whose factory is adjacent to the airport. These boats included trips over Manhattan with many notable, among whom were Charles A. Levine, Rear Admiral Clegg, U.S.N.R., of the Grangebank Fund, etc., and also, a trip to Washington and back.

The planholders of Teaneck Airport at the New York convention was again demonstrated during the month when air and transportation services located here for the purpose of fulfilling their needs.

Airplane racing types and models were seen around the field, Bellanca, Fairchild, Fokker, Ford, Hispano, Travel Air, Detroit, Waco, and the famous old Jenny.

### Winston-Salem, N. C.

By Robert C. Hendon, Jr.

With the arrival of new equipment for Miller Municipal Airport here and the announcement that Reynolds Aviation, of North Carolina Inc., the license, has closed negotiations as new representatives for several states of planes, aviation interest locally is showing a decided pickup.

A Fokker Universal four passenger cabin monoplane has

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just arrived and is proving quite popular. It has been busy with short hops and some rather extended flights have been made. The place has been chartered for several-day trips to local points, the trips to be made shortly. The monoplane was painted in Western-States from Curtis Field, N. Y., by August Heuer, and the design is based here by Leavenworth, designer of the airport.

Much improvement has been made in the field during recent weeks and a force of men will be kept busy until it is in the best possible condition. New has been placed along the edges of the field, where small washes occurred and the entire landing space is being smoothed over.

#### Lincoln, Neb.

*By Stevens Price*

While returning to Washington, D. C., from San Diego, Calif., when he delivered a new American plane to the airport, Captain Frank L. Lee, Captain Leslie C. Stevens, United States Legion of aviators and the second construction department, recently landed at the Lincoln aviation field and visited with relatives.

Lieutenant Commander Stevens is a former Lincoln team and student at the University of Nebraska and Nebraska Wesleyan University here.

#### Stevens Team and Dogson Airplanes

During the Navy's attempted flight to the Hawaiian Islands several years ago, Mr. Stevens was in charge of the airplane returning to the lost plane. He was then stationed on the old airplane carrier *Langley*. Since earning his pilot's wings five or six years ago he has used his skill in test flights as well as designing them. He has been in the Navy nearly 29 years.

Jimmy Angel, Fresno, Calif., now in a 25,000 ft. Pres-

American flight, learned to fly at the aircraft school here where Col. Charles Lindbergh took his training.

Angel's plane on 25,000 ft. took several years ago with a desire to learn aviation and getting one, Ray Price, president of the Lincoln Standard Aircraft Co. sent flying school pilot, Alvin C. "Al" Shultz, to Angel's monoplane developed into a two-machine, and a cockpit four.

After pilotizing the steeds for five years as a tree planeman, Paul Shultz has taken up his motorcycle license. He has accepted a position on the manufacturing department of the Lincoln Aircraft Corp. and intends to work through the aeronautics manufacturing departments into the main division.

Shultz has always had a keen interest in aviation and during his vacation took short courses in flying. He has had 100 hours of flying instruction, chiefly in seven-county soil.

#### Pittsburgh, Penna.

*By Fred A. Tamm*

Pittsburgh just recently became a link in a chain connecting with a nation-wide airway express service, when Doug Noyes, are used pilots, took off for Cleveland from Bush Field in an airspeedster Ryan monoplane.

The event was preceded by appropriate ceremonies witnessed by more than a thousand spectators. The program consisted of short addresses by Major Charles H. Kline, City Court Hall, the Allegheny Express Contractor, and the flying airmen of the American Railway Express Co. Vice President C. W. Hoban, Gen. Mgr. F. J. Hartke, and J. F. Johnston, local district manager.

The Aero Club of Pittsburgh which just recently announced its plan for holding its Third Annual Bigo Model Airplane Contest, has decided to adopt the rules of the National Model Airplane Tournament which has been unannounced by the

Regional & Western Association of America, and thus give the visitors a chance to compete in the national trials at Atlantic City in October.

#### Madison, Wis.

*By E. C. Stevens*

Orders for the purchase of six Travel Air biplanes from the Mid-West Air Transport Co. of Madison were signed in blank recently by the Beloit Airway Co., W. A. Eliason, president of the Mid-West Air Transport Co. of Madison and the others. The Madison company is to be used for its Travel Air planes.

Regis E. Crowley, a brother of Lee T. Crowley, Madison, a president of the Beloit Airway Co. Its stock is controlled by local business men and it has 88 acre landing field which is on the site of a 400 acre farm, near Beloit.

Beloit among those who have recently signed orders with the Mid-West Air Transport Co. for planes are L. C. Hoffman, Madison insurance agent; Robert Bostick, Richard Latz, Henry Bostick, and the Golden Airway, Inc., all of Oakdale, and Shirley Gerald of Appleton, Wis.

#### Superior, Wis.

The Head of the Lakes Flying Club, which was announced a short time ago, is meeting every Wednesday evening to discuss the various phases of commercial aviation. At the present time the members are studying the design, construction, maintenance, operation, and maintenance of several well known airplane engines. The meetings, which alternate between Superior, Wis., and Duluth, Minn., are under the direction of Walter Borchardt as president. Max O'Kane is vice president, local to Superior, and L. T. Beagle the treasurer.

#### Port Sanilac, Mich.

A 40 acre airport is planned by this tiny Michigan village of 155 people. Latest equipment comprising night lanterns, pet lights and other apparatus will be installed at the new airport. Village authorities are being aided in planning the airport by Jack Workman of the Michigan State Aviation School, Detroit.

#### Winona, Minn.

*By Joseph B. Hall*

The way to the regeneration of a languishing airport by the city of Winona was finally cleared recently by the arrival of an early model of estimate and taxation of a 150,000 acre tract soon to take care of the cash payments on its purchase.

The city's park board appeared the purchase of Winona-Lindbergh Field for use as a municipal airport some time

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A terrible family of angles was presented when these planes were recently gathered on the San Antonio, Tex., municipal airport, but A. P. Hart, who designed the subject plane on the left, and his craft the "Canyon," hence the designation as the "Canyon," the large monoplane at a fixed altitude, while the plane in the foreground is a Ryan Biplane,

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age, but the project had to pass the board of accountants before funds could be secured. The accountants for each payment of \$90,000 to the owners of Wild Chancery Lane Field and of \$50,000 to the owners of adjacent land included in the airport. A 30 yr mortgage bearing 8% interest, will take care of the remaining \$75,000, or \$1,000 a month.

C. F. Kipps, president of the board of trustees, objects to a clause in the instrument providing forfeiture of \$1,000 and reversion of the land to the original owners if the rights on the mortgages were ever violated or breached. No objection to modification of this clause is expected.

**Worcester, Mass.**  
By Henry T. Ford

More members of the Worcester Society for the Promotion of Aviation have donated \$100 to the club treasury for the purchase of an airplane to be used by club members for glider and flying instruction. The members who made the donations are: William C. Sylvester, president; Eugene D. Shirey; R. H. Wilder, Worcester; A. B. Weller, Worcester; Ernest Teira, Northbridge; J. Karrow, Farnham; Thomas Flynn, Shrewsbury; John Morely, and Alton J. Worcester.

The club is planning for a social and dancing party as means of raising additional funds for the purchase of a plane. Reginald P. MacLennan, a former member of the Royal Canadian Flying Corps during the war, spoke at a recent meeting of the society.

The planing of an air and boat in the business section of Worcester has increased the amount of mail sent to the marine box not enough to warrant a stop of the New York to Boston plane, which passes over Worcester. The mailing of documents, however, has been increased in between the air and mail at Wharfdale Field and Boston. H. Goddard, manager, and Frank H. Colverley will make a trip to Washington to interview post office officials.

**Boston, Mass.**  
By Edward Marshall

Boston figured in the Boston affair with credit, despite a radio complaint of a New York manufacturer who failed to have a Boston plane for a Canada trip. First flew Boston to New York, then Boston to Ottawa, then Ottawa to Montreal, then to Quebec, and brought back the first mail which was due. Boston flew down from Montreal. Stark flew round to Central Field, N. Y. He bought a group of mail to Boston to be held with, attached a rubber hose to it and let it out per pipe leading up to his center wing gasoline tank. Stark, by suspending the tank, got the gas into the plane and let it back so he was able to make the long non-stop flight and leave enough left to take him from New York back to Boston, Mass.

### Record Air Mail Week

Paul Richard Mackie of Guelph had the mail run of Ontario during Stark's absence in Canada, and made a record week of it by completing all trips in time or ahead of time. Weather conditions of course were ideal. One day a 500-mi. round trip was made in 220 min. run in his Fokker. Flying in 80° heat, the present record. That same week he made a record altitude record for a week day with a flight of 80,000 ft. on out of Boston.

Assessments are expected soon by Edward T. O'Neil, of the first midwest air school course in New England, as he operated on Martha's Vineyard this summer. O'Neil is associated with Douglas Merrill, Tom Wilson of Boston, and a mechanic, and has a five year lease on a large field at the Vineyard and a large farmhouse which he expects to use.

as a dormitory. He expects to keep two or three planes and pilot busy there with classes opening about the middle of June.

Two planes added to Boston's list recently include a Fokker cabin monoplane delivered to the Dennis Auto parts and one being piloted by Capt. Albert L. Rosen of the Boston National Guard, two new American Eaglets to the New State Flying Service at the Boston Airport. The new Eaglet was to the Hanes Airport Corp., a new F7 for the Army Reserve, and the first Fokker Alexander Eagleridge to the Major Field of the Reserve recently.

One Colony has built a small operations office on the terminal's place to start work on one or two single plane hangars in the operations office.

Boston Airport Corp. has opened an exciting general school as contracted by Edward C. Savage, organizer of the school and at present an instructor in instruction of M.F.T. D. 750 to \$50 for 10 hours and includes one airplane ride. The Naval Reserve flying school started at Spanish Fort last September April 20 with Capt. Reginald D. Thomas as instructor, Capt. W. G. Green as executive officer, and Capt. Joseph H. Lyons assisting as instructor. A half dozen reserve ratings and beginners have been ordered to early flight.

**Baltimore, Md.**  
By Harry Eads

The forming of the fleet of eight airplanes of the Chesapeake Aircraft Corp. here was recently christened the "Hornbills" because large assemblies. It is a four place Fairchild cabin monoplane. The other planes are two passenger Travel Airs. The Fairchild is equipped with a lead speaker so that the pilot may act as "public address." Wings to 60 ft. long and other feature planes are scheduled.

All of the planes of the Chesapeake Aircraft Corp. are used after waterfowl found in the Chesapeake Bay.

Miss Perry Black used a bottle of rosé champagne for the christening, courtesy in all expectation. The first attempt at cracking the bottle, which was ribbon-and-wicker covered, resulted only in a deep cut in the aluminum nose of the plane. A second attempt on the steel propeller was more successful.

Immediately after the christening John A. Hambleton took the Misses Miss Perry Black, Harry Oldman, Charles L. Whitley, and Nellie C. Bayes as guests. Maj. William D. Taylor took Capt. Charles C. Clegg, Capt. Edward S. Baldwin, Raymond Thompson, Lt. Doug Young, and Howard Clegg, all present, were there accepted.

The name of the Air Corps of the Maryland National Guard has begun with an amendment of the latest type of plane such as it had never enjoyed before. All were but recently received, three being of the O-33 type, two P-25's and two T-29's. Two planes of the PT-3 type will be received before the summer approaches.

General Chamberlain came unexpectedly stopped in Baltimore recently. He was the guest of a former student of U. S. Corps.

**Lexington, N. D.**  
By Walter Rogers

The town has now secured a landing field through the operation of the citizens. At present there are two planes at the field doing passenger work and teaching a number of flying students. Paul Skinner has been flying all winter. Dr. Niemehag of this town has found the airplane a safe and quick way to make his calls, especially as when roads are extremely impassable as they are at times during the winter.

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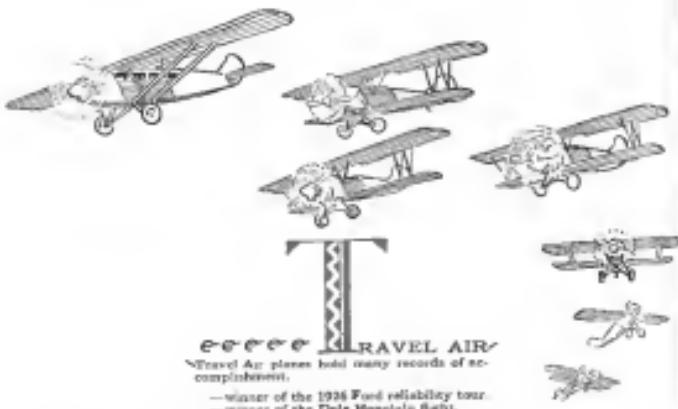












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